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# Is human-animal inequality foundational to human inequalities?

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## Declaration

I declare that this thesis is an original report of my own research, has been written by me and has not been submitted for any previous degree.

Signed

Thomas Murdock

## Acknowledgements

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## Lay summary

Every year billions of animals are routinely killed for humans to eat. The exact number of lives taken, and the amount of pain and suffering inflicted on animals at the hands of humans is unimaginable. In total, the ill treatment of animals by humans, and the apathy shown by the public towards their plight represents a widespread inequality. Interestingly, some humans are oppressed in ways that reflect human-animal inequality in the meat industry. For example, drug addicts are routinely persecuted by the state despite needing help, and workers in developing countries such as Bangladesh are exploited in the production of cheap clothing for the developed world. In a similar way to human-animal inequality, both drug addicts and sweatshop workers are systematically oppressed and the public are indifferent to their suffering. However, the magnitude of human-animal inequality is arguably worse as they are routinely slaughtered at the end of a short, grueling life. Because of this, we thought that support for human-animal inequality would be foundationally connected to human inequalities, such that challenging human supremacy would reduce support for human-animal inequality, and would subsequently cause a reduction in support for human inequalities. To test our hypotheses, participants wrote a short paragraph that challenged either (a) human supremacy over animals, (b) supremacy over drug addicts, or (c) a control condition. We then measured support for various inequalities. Overall, we found that support for human-animal inequality was related to support for human inequality, however, it was not foundational. Whilst people that were indifferent to the suffering of animals were also likely to be indifferent to the suffering of humans, the indifference towards animals was not the best predictor of indifference towards human suffering. In addition, we found no strong evidence that challenging human supremacy reduces support for either the human-animal or human inequalities. This highlights the difficulties we face in society, as we try to challenge harmful behaviours that have become the norm.

## Abstract

Around the world, human-animal inequality is widespread; the meat industry alone slaughters billions of animals each year. Some human groups face similar inequalities. For example, drug addicts are routinely persecuted by the state despite needing help, and workers in developing countries such as Bangladesh are exploited to produce cheap clothing for the developed world. In a similar way to human-animal inequality, both drug addicts and sweatshop workers are systematically oppressed and most people are indifferent to their suffering. However, the magnitude of human-animal inequality is arguably greater as they are routinely slaughtered at the end of a short, grueling life. Because of this, we wanted to determine whether human-animal inequality is foundational to inequality between human groups. Specifically, we hypothesized that challenging human supremacy over animals would reduce support for human-animal inequality, and would subsequently cause a reduction in support for human inequalities. To test our hypothesis, we employed a self-persuasion task that challenged either (a) human supremacy over animals, (b) non-addict supremacy over drug addicts, or (c) a control condition. We found consistent evidence that support for human-animal inequality and human inequalities were strongly correlated. However, we found no robust evidence that challenging human supremacy reduces support for either the human-animal or human inequalities. This research illustrates the difficulties we face when designing interventions aimed at reducing supremacist beliefs. Further, it highlights the challenges we face as a society, as we try to address harmful behaviours that have become the norm.

## Introduction Overview

The purpose of this thesis is to examine whether human-animal inequality is foundational to human inequalities.

The three introductory chapters of this thesis provide a thorough overview of the psychology of human-animal relations, and the connection between human-animal relations and human relations. Chapter 1 provides a broad overview of the psychology of human-animal relations; chapter 2 explores the psychological theories that have been applied to human-animal relations; and chapter 3 suggests that human-animal inequality may be foundational to human inequalities.

More specifically, chapter 1 focusses on human-animal relations in the United Kingdom (UK). We will cover a broad range of human-animal relations, including both positive and negative, and provide a comprehensive overview of the empirical psychological research available. We describe direct positive relations such as pet ownership, and veterinary medicine, and indirect positive relations such as the UK public donating money to animal welfare charities and people who watch wildlife documentaries.

In the second half of chapter 1 we describe direct negative human-animal relations such as people who work in the animal agriculture industry, and indirect negative human-animal relations such as people who purchase meat from the animal agriculture industry. We describe the limited research that is known about the psychological consequences of directly killing animals for a living. The consumption of meat is then given as the example of indirect negative human-animal relations. In this section, we draw on the theory of the meat paradox to explain how people can both love and eat animals. We conclude chapter 1 by suggesting that in total human-animal relations constitute a widespread inequality, in which humans are afforded moral concern, the right to life, and are protected by the law. Most animals that humans interact with (e.g., farmed animals), however, are subject to the most violent and brutal treatment at the hands of humans; are beyond the realm of moral concern; and are not afforded even the basic right to life.

In chapter 2, we turn our focus towards the psychological theories that have been applied to human-animal relations. We first describe how attachment theory has been used to explain relations between pet animals and their owners. We then describe Social Identity Theory and Terror Management Theory that reveal how we think about social categories and death and the impact this has on human-animal relations. We will show how the literature on stereotyping and prejudice has informed our understanding of human-animal relations, and how human-animal relations has in turn advanced the stereotype and prejudice literature. System Justification Theory is discussed which reveals the possible role of justifications in the exploitation of animals and we provide a Cognitive Dissonance Model of explaining morally troublesome human-animal relations. We conclude chapter 2 by suggesting that while the psychological theories that have examined human-animal relations have made important advancements they fall short of answering whether human-animal inequality is foundational to human inequalities.

In chapter 3, we turn our attention towards the psychological consequences of being indifferent to human-animal inequality, and provide our novel contribution to the literature. The two novel contributions of this thesis include 1) extending the scope of human outgroups thought to be associated with human-animal inequality, and 2) examining whether human-animal inequality is foundational to human inequalities.

To discuss the first novel contribution, the current literature on human-animal relations is provided which reveals it is limited to how perceptions of animals are related to *active* prejudice towards national human outgroups (e.g. racism). This thesis adds to the literature by showing how human-animal relations are related to *passive indifference* to the suffering of two human groups. The two groups used in the current research are drug addicts in the UK, and sweatshop workers in Bangladesh. We illustrate how these two inequalities function and how they are conceptually similar to human-animal inequality. We argue that the psychological mechanisms that help people reduce dissonance arising from harming animals are the same psychological mechanisms that help people reduce dissonance about other morally

troublesome inequalities such as the persecution of drug addicts in the UK and the exploitation of developing world labour. We see these two inequalities as examples of a wider psychological phenomenon whereby good people indirectly perpetuate harmful inequalities in society.

We conclude chapter 3, and therefore the introduction of this thesis, by providing the second novel contribution of this thesis that is to consider whether human-animal inequality is foundational to human inequalities. Specifically, we reason that human-animal inequality would be foundational to inequality between humans because meat consumption requires animals to be killed, whereas inequality between human groups (such as the exploitation of developing world human labour) does not. We then discuss that if human-animal inequality is foundational to human inequalities, then reducing support for human-animal inequality should by default reduce support for human inequalities.

# Chapter One: The Psychology of Human-Animal Relations

## 1.1 Chapter Overview

The psychology of human-animal relations is a very new field of enquiry. The purpose of this chapter is to give an overview of the most common human-animal relations in the UK, accompanied by the most relevant empirical psychological research known about those relations. Human animal relations can be separated into positive and negative relations, based upon whether the treatment of animals by humans is positive or negative. The sections on positive and negative human-animal relationships are comprised of direct and indirect relations. Direct relations are those such as interacting with one's pet, whereas donating money to an animal welfare would be an example of indirect relations. The purpose of outlining both the compassionate and the dark sides of human-animal relations is to show the ambivalence that characterises them. Juxtaposing the compassionate treatment of pet animals with the harmful treatment of meat animals is important because it paints a realistic picture of human-animal relations; they are not all good or all bad. We want to show that human-animal inequality does not simply reflect a form of prejudice (i.e. speciesism), which the most relevant psychological theories reduce it to (see chapter 2). Human-animal inequality is a much more nuanced subject than prejudice, and therefore requires a broad theoretical framework to fully appreciate the psychology behind human-animal inequality (See chapter 3). We begin this chapter by discussing the positive human-animal relations, before reviewing the negative side of human-animal relations.

## 1.2 Positive Human-Animal Relations

We provide an overview of positive human-animal relations beginning with the direct human-animal relationships between pets, their owners, and vets. In the second part of this section on positive human-animal relations, we give an overview of the indirect ways which people indirectly relate positively to animals, using the examples of charitable donations to animal welfare organisations, and people's interest in watching wildlife documentaries.

**1.2.1 Direct positive human-animal relations: Pets and Vets.** From the pets children grow up with, the veterinary surgeons (vets) who look after

those animals to the zoos we visit, and the birds or small mammals such as squirrels that live in UK cities, there are many different ways we interact directly and positively towards animals. In this section, we just focus on the most common form of positive direct human animal relations in the UK: the relations between pets and their owners, and between pets and the vets who look after them.

***Pet ownership.*** Pet ownership in the UK is characterised by a large and well looked after population of cats and dogs, living in urban areas, who receive regular food, shelter, and medical treatment (Murray, Gruffydd-Jones, Roberts, & Browne, 2015). For a sense of the scale of pet ownership today in the UK, one in two households has at least one cat or dog (Aegerter, Fouracre, & Smith, 2017). More specifically, one in three households in the UK has at least one pet dog; one in four has at least one pet cat; and one in eight has at least one pet fish (Aegerter, Fouracre, & Smith, 2017; Murray, Gruffydd-Jones, Roberts, & Browne, 2015). To look at this in another way, across the UK, there are around 12 million dogs and 10 million cats (Aegerter, Fouracre, & Smith, 2017). People in the UK own a lot of pets, and pet ownership around the Western world shows a similar pattern with Sweden, Netherlands, France, Germany, Spain, Belgium, Australia, Canada and the USA showing similar, if not greater, levels of pet ownership (Global Growth From Knowledge, 2016; Murray, Gruffydd-Jones, Roberts, & Browne, 2015). In the East, pet ownership is lower in countries such as China (25% own a dog, 10% own a cat), Japan (17% own a dog, 14% own a cat), Hong Kong (14% own a dog, 10% own a cat), and South Korea (20% own a dog, 6% own a cat) (Global Growth From Knowledge, 2016).

In the UK, for the most part, pets are very well looked after, and treated with care by their owners. For example, each year UK pet owners spend on average £1000 on each dog, and £500 on each cat, totalling £15 billion on pet expenses (Aegerter, Fouracre, & Smith, 2017). Further, there is no evidence of a measurable population of stray dogs in the UK, with almost all dogs in the UK either housed with private pet owners, or housed by animal welfare organisations (Aegerter, Fouracre, & Smith, 2017). However, there is a small

population of stray (receiving some care) or feral cats (receiving no care) that live on the streets. The population of cats in the UK that do not have a home but receive constant food or medical attention (i.e. stray) is estimated to be around 1.5 million. Around 5000 of those 1.5 million cats are feral, and experience no contact with humans whatsoever (Aegerter, Fouracre, & Smith, 2017). Despite this, pet ownership in the UK is characterised by a large population of cats and dogs who are well looked after, and have regular access to shelter, food and medical attention (Aegerter, Fouracre, & Smith, 2017; Murray, Gruffydd-Jones, Roberts, & Browne, 2015).

***Psychological consequences of pet ownership.*** Just as pet animals in the UK largely benefit from the pet industry, research suggests that there are largely positive psychological effects for humans living with pet animals. Pet ownership has been positively associated with both developmental and health outcomes. Developmentally, the relation between pets and pet owners can be thought of and measured in terms of psychological attachment. Pets can serve as attachment figures for humans (Kurdek L. A., 2008; Kurdek L. A., 2009); attachment to pets can be reliably measured (Johnson, Garrity, & Stallones, 1992); attachment style can be assessed using the "strange situation" with dogs and their owners (Marinelli, Adamelli, Normando, & Bono, 2007); and anxious attachment to pets is associated with psychological stress (Zilcha-Mano, Mikulincer, & Shaver, 2011). Attachment to pets is also associated with increased satisfaction with pet behaviour (Serpell, 1996), and children's well-being (Paul & Serpell, 1996). There is also some correlational work showing that witnessing animal abuse in childhood is associated with violence against animals in later life (Hensley, Tallichet, & Dutkiewicz, 2012), however, these studies are all correlational and retrospective and so caution should be taken in interpreting these findings. Moreover, in a recent review of the psychology of human animal relations, the authors suggest that the positive impact of pet ownership on pet owners could be moderated by how central of a role pets play in people's lives (Amiot & Bastian, 2014). For instance, if people are living alone with just their pet animal, that animal is likely to have a greater positive effect on the owner than if the owner was living in a

happily-functioning family home whereby the other humans in the house provide greater emotional support and social connection (Amiot & Bastian, 2014). Nonetheless, the research on pet ownership suggests there is a largely positive effect of living with pet animals.

The research on the health benefits of pet ownership is more mixed, with some studies showing positive benefits of pet ownership, and some studies showing negative costs for pet ownership. Looking at physical health, a study by Friedmann, Katcher, Lynch, and Thomas (1980) found that among 92 heart attack victims, after one year, 28% of pet owners had survived, compared to 6% of nonpet owners. However, a more recent study found that among 424 heart attack victims, 22% of pet owners were likely to die or suffer remissions, compared with 14% of nonpet owners (Parker, et al., 2010). In addition, research has shown both positive and negative effects of pets' ability to buffer against stress. For example, in an experimental study, hypertensive stock brokers were assigned to either a pet or a no-pet condition; 6 months later, participants with a pet had a smaller increase in blood pressure during a stressful task than nonpet participants (Allen, Shykoff, & Izzo, 2001). However, this finding was not found in ealrier work (Straatman, Hanson, Edenburg, & Mol, 1997).

The empirical evidence for the impact of pet ownership on mental health is also mixed, with studies reporting both positive and negative effects. For instance, a recent systematic review of seventeen quantitative studies found positive, negative and neutral impacts of pet ownership on mental well being (Brooks, et al., 2018). In a two study paper, Zilcho-Mano, Mikulincer, & Shaver, (2012) reported that (1) pet ownership was associated with greater aspirations and higher feelings of self-efficacy when the pet was physically or cognitively present, and (2) feelings of attachment to one's pets reduced blood pressure during a stressful event when adult pet owner's pet is present. However, there is also research detailing the negative aspects of pet ownership, particularly for people with diagnosed mental disorders, or when the pet was a financial burden or when the animal was unruly and difficult to look after (Brooks, et al., 2018). In short, living with pet animals can come with developmental and

health benefits, however, these benefits are more pronounced in people who already lack social relationships with humans (Pachana, Ford, Andrew, & Dobson, 2005; Peretti, 151-156).

***Pets and Vets.*** The psychological impact of interacting with pets in a veterinary capacity is also mixed: there is good evidence that being a vet is accompanied by a myriad of both positive and negative experiences. Undoubtedly, many vets have a satisfying career and thoroughly enjoy working with animals (Batchelor & McKeegan, 2012). However, because vets deal with many sick pet animals, vets are often faced with difficult decisions surrounding the treatment of their patients (the animals), such as when pet owners insist on continuing treatment, despite poor animal welfare, solely to maintain the animal's life. Vets can find these dilemmas very stressful, and this is part of the reason why vets can experience poorer well-being and mental health compared to other professions, such as doctors (Batchelor & McKeegan, 2012). For example, the ethical dilemma of whether a sick animal should be put down is a constant part of a vets work which can be not only stressful during working hours, but can also bring feelings of grief and loss that continue at home (Batchelor & McKeegan, 2012). The stress and grief of treating and euthanizing sick animals, coupled with long working hours and poor work-life balance, can lead to increased levels of drug and alcohol problems among vets, and poorer mental wellbeing (Platt, Hawton, & Mellanby, 2010).

Unfortunately, occupational stress and poorer mental wellbeing, coupled with vets' expertise in euthanasia of animals and drug administration contributes to vets being the profession most at risk of suicide (Tran, Crane, & Phillips, 2014). Vets have a suicide rate four times higher than the general population, and twice as high as other health professionals, highlights the unique impact that working with animals can have on wellbeing (Bartram & Baldwin, 2010). While many vets undoubtedly get a lot of satisfaction and enjoyment from working with and helping animals, the evidence also suggests that working with animals can have an impact so negative that it effects their will to live. This very unfortunate association between working with sick

animals and suicide illustrates vets' tragically strong human connection to the animals they care for.

Looking at the psychology of both pets and vets shows that human animal relations can have a significant psychological impact on people (Friedmann, Katcher, Lynch, & Thomas, 1980). How we interact with animals can have a profound impact on our health and well-being for both the good and the bad. Pet owners and vets go to great lengths, financial and emotionally, to look after and treat animals (Amiot & Bastian, 2014). In addition, pets for many are part of the family; people get to know the rich inner lives of their pet animals and realise their animals have their own personalities and preferences (Amiot & Bastian, 2014). In short, pet owners and vets care a lot about pet animals in the UK. It is thought to be morally and legally wrong to harm pet animals in the UK, with tough laws protecting pet animals and people sent to prison for violating these laws (UK Parliament, 2019). The strong concern for the welfare of some animals in the UK is also evident in indirect human-animal relations such as in the large number of charitable donations made to animal welfare charities and the UK's interest in wildlife documentaries.

**1.2.2 Indirect positive human-animal relations: donations and documentaries.** Positive human-animal relations can also take an indirect shape through charitable donations and watching documentaries about animals and human-animal relations. We therefore divide this section into two smaller subsections; donations and documentaries.

***Donations.*** Overall, the UK ranks 11th in the world (7th in the world when looking at a 5-year trend) in the Charities Aid Foundation (CAF) world giving index for the most charitable country, with 64% of Brits having reported giving money to charity in 2016 (Charities Aid Foundation, 2019). Each year, inhabitants of the UK give around £10 billion to charities, with £80 million (8%) going to animal welfare charities. This pattern of charitable donations to animal welfare charities reflects the literature on pet ownership; a significant portion of the UK population care deeply about the welfare of some animals.

In a 2017 study (N = 4028) which asked UK participants which charitable causes they had given to in the past 4 weeks, animal welfare charities were the second highest recipients of charitable donations (24%), second only to medical research (26%) (Charities Aid Foundation, 2019). Moreover, those same participants gave more money to charities that seek to improve the welfare of animals, than to charities aimed at children or young people (23%), hospitals (23%), or overseas aid and disaster relief (23%). In the same study, looking at the proportion of donations given in the past 4 weeks, only religious organisations, and overseas aid and disaster relief received a higher portion of donations (19% and 12% respectively); medical research, hospitals and animal welfare charities received the same amount (8% of total donations in) (Charities Aid Foundation, 2019). In that same 4 week period, animal welfare charities received more money than charities for children and young people (7%), homeless people (7%), physical and mental health (6%), conservation and the environment (5%), disabled people (%5), the elderly (3%), or education (2%) (Charities Aid Foundation, 2019).

There is little empirical psychological research on why people choose to donate to animal welfare over other competing human organisations. The little research conducted suggests that women (Neumayr & Handy, 2017); people who are more empathetic (Bennett, 2003); more left wing (Neumayer, 2004); more responsive and protective of others (Sargeant, Ford, & Hudson, 2008); and who have low religious attendance (Neumayr & Handy, 2017) are more likely to give to animal welfare charities than human charities. When people do donate to animal charities, one study has shown that using negative imagery of a dog in a shelter (guilt appeal) is more effective than using positive imagery of a happy dog (warmth appeal) on intention to donate money and time to an animal welfare organisation (Haynes, Thornton, & Jones, 2004).

In summary, people in the UK care greatly about the welfare of cats and dogs, donating approximately £80 million annually to animal welfare charities. Further, it is striking that people choose to donate significantly more money to animal welfare charities than they do to human charities such as those that

care for children, the elderly, or the homeless. Beyond moral concern for the welfare of pets, people are also interested in wildlife and marine animals.

***Documentaries.*** From children's books, such as Winnie the Pooh and Peter Rabbit, to the BBC's The Planet Series (a comprehensive TV docuseries on wildlife presented by Sir David Attenborough, including Blue Planet, Frozen Planet and Planet Earth), people are fascinated and awe struck by wildlife and nature. There are many different examples of TV shows on animals that detail our interest in animal life, however, we focus on the recent 2017 documentary series by Sir David Attenborough, *Blue Planet II*, to illustrate people's interest in wild animals. *Blue Planet II*, sequel to *The Blue Planet*, debuted in the UK in October 2017 and was watched by over 14 million people – one in five Brits (BBC , 2018) . *Blue Planet II* not only received numerous awards, winning *Best Sound* and *Best Photography* at the 2018 British Academy Television Craft Awards, but was also the most watched TV show of 2017 (BBC , 2018). That is, more people tuned in to watch an educational documentary about marine life, over any other TV screening of news, sports, fashion, or reality-TV. While *Blue Planet II* had amazing footage of marine life, it was also a documentary series aimed at ocean conservation, and the impact that human life is having on the ocean (e.g., plastic waste in the ocean, the bleaching of coral reefs). Sir David Attenborough discussed the negative impact humans are having on the earth's oceans, and urged viewers to change their behaviour to help save the marine life as we know it. Considering *Blue Planet II* was an educational documentary series about the wonders of life in the oceans and the ways in which humans are harming them, the UK public clearly are fascinated by, and care about, the welfare of some animals in addition to pets.

### 1.3 Negative Human-Animal Relations

Just as there are different positive human-animal relations, there are also many different negative human-animal relations. For the remainder of this chapter, we provide an overview of *direct* negative human-animal relations beginning with the animal agriculture industry. In the second part of this

section, we give an overview of the *indirect* negative relationships people have with animals, using the example of meat consumption.

**1.3.1 Direct negative human animal relations: the animal agriculture industry.** There are myriad ways in which humans directly harm animals, and together these constitute a widespread inequality. Humans tend to harm animals for one of four reasons; for food, fun, fashion, or science (Piazza, Cooper, & Slater-Johnson, 2019). In the UK, people harm animals for food in the meat and dairy industry. Animals are harmed for fun and entertainment in the horse/dog racing industry, in foxhunting, and in zoos and aquariums. People harm animals in the fashion industry e.g., leather, wool, fur, and people also harm animals for science in medical testing (Piazza, Cooper, & Slater-Johnson, 2019; Piazza, Landy, & Goodwin, 2014). While there are unfortunately many examples of the ways in which humans harm animals, this thesis focuses on the animal agriculture industry as an example of direct negative human-animal relations as it is the largest and most widespread way in which humans exploit animals (Intensive Farming in The UK by Numbers, 2019).

***Animal Agriculture Industry.*** The animal agriculture industry is where the most harm is done to animals both in the UK, and around the world (Pig Welfare, 2019). This is primarily due to the large number of animals that are killed for food, but also due to the extensive suffering they experience throughout their lives (UK Government, 2019). The animals most commonly farmed in the UK for food are cows, pigs, sheep, and chickens, which together contribute over £8 billion to the UK economy annually (British Meat Processors Association, 2019). Every year, the UK kills about 2.5 million cows, 10 million pigs, 14 million sheep, 800 million fish, and 1 billion birds (e.g., ducks and chickens) (Humane Slaughter Association, 2019). To put those numbers into perspective, killing two billion animals each year is equivalent to killing 5.5 million animals every single day, or killing the entire population of the UK (66 million) every 12 days.

While there are many people involved in the animal agriculture industry, just a small minority work in slaughterhouses (British Meat Processors

Association, 2019). Further, within slaughterhouses only one or two people are usually responsible for stunning and killing the animals (Humane Slaughter Association, 2014). Indeed, there are many people involved in the animal agriculture industry who do not personally harm the animals. Farmers who rear animals, and truck drivers who transport animals, can be kind and decent people who look after the animals as best they can while they are under their care. Even farmers that work on factory farms, and subject animals to harsh treatment, do not necessarily have strong negative attitudes towards animals, they are likely simply trying to make a living. We believe that most people involved in animal agriculture do not hate animals and are not motivated to hurt them. Instead, they are likely trying to earn money and so their financial position in the marketplace is more likely the motivation behind their behaviour than prejudice or speciesism.

While the killing of animals in the UK is a grotesque example of the dark side that humans possess, the people (overwhelmingly men) who work in slaughterhouses are themselves often victims of the animal agriculture industry (MacNair, 2002). The working conditions in an average slaughterhouse are generally very grim. Surely, few (if any) young men grow up with the aspiration to spend their working days killing animals. In addition to the violent act of killing, the smell of blood, and the sounds of heavy machinery, the squealing pains of suffering animals surely weigh heavy on the shoulders of slaughterhouse workers. Perhaps then, it is not surprising that meat-processing plants find it difficult to recruit people to work in these conditions. Of the 75,000 people who work in slaughterhouses and meat processing plants in the UK, less than 30% are UK nationals (British Meat Processors Association, 2019). The remainder of the workforce is comprised largely of EU nationals - 69% of slaughterhouse and meat processing workers. By their own admission, the British Meat Processors Association (2019) note:

> “The common barrier to British people taking up roles in meat processing is an unwillingness to work in what is perceived to be a challenging environment. Most people, while they eat meat, find it difficult to work in its production partly because of the obvious aversion to the slaughter process” (Meat Industry Workforce, 2019).

Considering the violent nature of the work, there is very little research on the psychological consequences for people who kill animals for a living. In a recent study using 10,605 Danish workers, it was reported that compared to 43 other occupations, slaughterhouse workers had greater alcohol consumption, felt less rested in the morning after a day's work, were less likely to feel able to be working that job in 2 years' time, had lower work attendance due to sickness and days off, and had the lowest level of meaning from their work (Baran, Rogelberg, & Clausen, 2016). Other studies have found an association between working in meat processing factories and slaughterhouses, and the consumption of the highly addictive drug methamphetamine (Hendrix & Dollar, 2018), and excessive cigarette smoking (which subsequently results in an increased risk of lung cancer) (Kristensen & Lynge, 1993). In addition to increased drug consumption and cigarette use, slaughterhouse workers show increased anger, anxiety, and psychotism (aggressive and interpersonal hostility) (Emhan, Yildiz, Bez, & Kingir, 2012), post-traumatic stress disorder (PTSD) (Victor & Barnard, 2016), and excessive absenteeism as a coping strategy (Kristensen, 1991) when compared with other professions. There are also numerous physical dangers involved when working in slaughterhouses, such as cuts from knives, falls on slippery floors, sore muscles and tendinitis from repetitive daily use (Dillard, 2008). Further, these negative occupational consequences are not restricted to those who work within slaughterhouses, as people who work with animals before they arrive at the slaughterhouse, such as farmers and truck drivers, are also at risk of adverse psychological consequences (Malmberg, Hawton, & Simkin, 1997).

In this section, we have described the largest *direct* negative human-animal relationship; the animal agriculture industry. We described the high number of animals killed in the UK each year, and the few studies which have explored the psychological consequences of directly killing animals. While research on slaughterhouse workers is an important aspect of the psychology of human animal relations, it is also a very rare one. There are perhaps only a few hundred people in the UK who kill animals in slaughterhouses, yet there are millions of British people who benefit from this, and eat the meat of those

animals. Importantly, most meat eaters could not bring themselves to kill animals (Dillard, 2008), and so rely on others to do this for them. This group of individuals who like animals and do not want to harm them, but also pay others to kill animals on their behalf make up the vast majority of the UK public, and are the group we turn to for the remainder of this chapter.

### 1.3.2 Indirect negative human animal relations: The meat paradox.

The psychological tension between strongly caring for some animals (e.g., dogs), and being indifferent towards others (e.g., pigs), has been termed the meat paradox, and is the focus of this section. Most people in the UK eat meat, but most people have never, and will never have to, kill an animal to eat that meat. People in the UK often purchase their meat from supermarkets that is free from any bones, skin or blood – meat is, free from reminders of the meats origin (Kunst & Hohle, 2016). Alternatively, people consume meat at cafes and restaurants, which has additionally been cooked, seasoned and presented in a palatable fashion (Kunst & Hohle, 2016). For most people in the UK, meat is both psychologically and geographically removed from its origins as a living animal, and what happens to animals during this the process is absent for most meat eaters. In fact, most people in the UK have positive feelings towards animals as outlined in Section 1.2. As discussed previously, people donate money to animal welfare charities and regularly watch wildlife documentaries about the world and its animal inhabitants. In addition, people are also interested in animals in the wild, and people are fascinated and awestruck by animality as can be seen in the 30 million people visiting Irish and British zoos and aquariums each year (British and Irish Association of Zoos and Aquariums, 2019) (Whitworth, 2012). This fascination and moral concern for some animals is sharply contrasted with the UK's indifference toward the plight of other animals, such as the farmyard animals and fish that suffer in the animal agriculture industry. In contrast to the scant psychological research of directly harming animals (e.g., on people who work in slaughterhouses), there is a wealth of knowledge about the psychological consequences of indirectly harming animals (e.g., eating meat). The research on the psychology of eating meat fits into three categories: the eaten (animals), the eaters (meat eaters),

and the eating (the act of eating). There are psychological consequences of eating meat for each of these groups; that is, perceptions of meat animals, perceptions of humans, and perceptions of meat eating. We will discuss each of these three groups in turn.

***The eaten (animals).*** Technically all animals are edible and yet the UK diet of meat is comprised largely of three animals; cows, pigs, and chickens (British Meat Processors Association, 2019). The reason for this is twofold. Firstly, farmers over millennia have selected animals for docility, meaning that herbivorous mammals such as cows and pigs can be kept in herds together, and are largely not dangerous to the people who farm them (Darwin, 2004). Secondly, possessing a mind or the capacity to suffer is a key characteristic required for attributing moral concern to others (Bentham, 1789). Because humans have evolved to afford moral concern to entities which possess humanity (Plous, 1993), or a complex mind, those animals which are dissimilar to humans and are deemed mindless (e.g., pigs) are considered edible whilst those deemed to have a complex mind are not (e.g. chimpanzees). In the UK, it is taboo and illegal to eat chimpanzees or dogs, even though chimpanzees and dogs are as edible as pigs (and are eaten without concern in other cultures). In this instance, chimpanzees are seen to be less edible because they pose more of a threat to farmers than pigs, are more like humans than pigs, and are deemed more intelligent than pigs (Ruby & Heine, 2012). Similarly, dogs are also more dangerous than pigs, are seen to be more similar to humans when domesticated, and are deemed more intelligent than pigs, (despite evidence illustrating that dogs and pigs have similar levels of intelligence) (Mendl, Held, & Byrne, 2010).

There is empirical evidence that humans see meat animals as possessing less mind than animals that are not eaten, and that when classified as meat animals, people attribute a lesser mind to an animal. In one study, people were asked to rate the edibility and capacity for mind for 32 different animals (Bastian, Loughnan, Haslam, & Radke, 2012). The researchers found a strong negative relationship between mind attributions, whereby animals that are more intelligent are deemed less edible. The relationship between mind

attribution and edibility has been shown to be malleable to simple characterizations of animals as either meat animals or not. For example, in another study participants were given a novel animal (Bennetts Tree Kangaroo) and told that it either lived in the wild or was used as food (Bratanova, Loughnan, & Bastian, 2011). Compared to the animal that lived in the wild, participants saw the animal that was used as food as having less mind and afforded the animal less moral concern.

Intergroup contact theory shows that, for humans under certain conditions, contact with a human outgroup can foster more positive outgroup perceptions, reduce dehumanization of the outgroup, and improve moral concern for the outgroup (Hewstone & Brown, 1986). In short, contact helps to reduce stereotypical and heuristic thinking, and people appreciate others as more 'fully human' after interacting with them. Recent research has shown that the positive consequences of intergroup contact can also be illustrated between humans and animal outgroups (Loughnan, Davies, Zaharieva, Kinga, & McLatchie, 2019). We took 50 people to Gorgie city farm in Edinburgh – a small petting zoo – and measured their perceptions of animals before and after the visit. Participants spent 30 minutes playing with different animals, and had close positive contact with meat animals such as sheep and pigs. We found that following contact with meat animals, participants thought the animals had more complex minds, attributed more moral concern to meat animals, showed a reduction in their justifications for eating meat, but fell short of showing a reduced commitment to eating meat. Like the geographical disconnection between the production and slaughter of animals in the UK, people also think about meat and animals somewhat independently – we could shift attitudes about animals, but not attitudes about meat consumption.

We replicated these effects using an imagined contact paradigm (Crisp & Turner, 2009) in which participants imagined meeting a lamb at a petting zoo (as they had in the previous field study). We found the same results: compared to control condition participants that imagined a nature scene, participants that imagined having contact with a lamb thought lambs had more complex minds, attributed more moral concern to meat animals, showed a reduction in their

justifications for eating meat, but again fell short of showing a reduced commitment to eating meat. As before, this illustrated that perhaps people think of animals and meat consumption as being independent of one another.

In sum, people think about meat animals in a motivated fashion; animals that we eat are conveniently seen as less mindful and less deserving of moral concern than animals that we do not eat (Piazza & Loughnan, 2016). And for most people, this occurs in the absence of actual knowledge about animal intelligence (Mendl, Held, & Byrne, 2010).

***The eaters (people).*** While our perceptions of animals changes as a function of whether those animals are exploited, there are also differences in the traits and characteristics of people who do and do not eat meat. Of course, people who eat meat and people who do not are not a dichotomous group; different people eat different amounts of meat; some people are conflicted about eating meat whereas others are not. However generally, those who tend to eat more meat tend to be more masculine, and observers also think that men who eat meat are more masculine (Rothgerber, 2013; Ruby & Heine, 2011). Meat can be used by men to both signal and exercise masculinity and consequently meat is viewed as a masculine food choice (Rozin, Hormes, Faith, & Wansink, 2012). In addition, meat is also more commonly consumed by the political right, and by people that score higher in social dominance orientation (a measure of preference and support for human hierarchical inequality) (Dhont & Hodson, 2014). In short, hyper-masculinity, political conservatism and social dominance are traits associated with eating more meat, whereas femininity, political liberalism social egalitarianism are associated with eating less meat, or abstaining from eating meat altogether (e.g., vegetarianism and veganism). It is noteworthy that while eating meat is associated with hyper-masculine men and political conservatism, most politically left-leaning people, and most women in the UK also eat meat, albeit to a lesser degree.

There are four key justifications that people routinely give to justify their meat eating behaviour – the four N's. People say that it is (1) natural to eat meat (i.e., our ancestors ate meat), (2) necessary to eat meat (i.e., we need to

eat meat for health reasons), (3) normal (i.e., everyone eats meat), and (4) that it is nice to eat meat (i.e., meat is delicious) (Piazza, et al., 2015). The four N's of meat eating justifications help people reduce the dissonance that arises from both wanting to care for and wanting to eat (and therefore kill) animals (Piazza, et al., 2015).

***The eating (meat consumption).*** Compared to the previous two sections on the eaten (animals) and the eaters (people), there is relatively less research on the psychology of eating meat. What is known is that following the consumption of meat, people are more likely to think that animals are less mindful and are less worried about their moral concern (Loughnan, Bastian, & Haslam, 2010). Further, in another study, even anticipating meat consumption led participants to see cows as less mindful and less worthy of moral concern (Bastian, Loughnan, Haslam, & Radke, 2012). Taken together, these two studies provide initial evidence that people psychologically navigate the consumption of meat both before and after the fact.

The product-production disconnection between meat and harming animals is an additional factor that influences meat consumption. Because most people who eat meat do not partake in the slaughter of animals, and because the processing of animals (farms, slaughterhouses and butchers) are paced on the outskirts of cities, most people can go their whole lives without having to come face to face with the origins of their meat (Bastian & Loughnan, 2017). Recent research exploring the connection between meat and its animal origins reported that participants were less likely to be empathetic towards animals killed for human consumption when the carcass was presented without a head, compared with when the head was still present. Further, participants were less likely to consume meat when paired with a visual of the living animal (i.e. the origins of the meat) (Kunst & Hohle, 2016; Kunst & Haugestad, 2018). In short, the physical act of eating meat has psychological consequences for our perceptions of and moral concern towards animals.

### 1.4 Chapter Summary

In this chapter, we wanted to show both the good and the bad of human-animal relations, the conflicting views about different animal species, and the

psychological gymnastics at work when we exploit animals. Indeed, human-animal relations span the absolute best and worst of human behaviour. We began by describing the love and attention people give to their pet animals, their willingness to support charities, documentaries aimed at improving animal welfare, the legal protection given to pet animals, and the punishments people receive for harming pets in the UK. We illustrated how many people in the UK care deeply about the welfare of animals such as cats and dogs, and how empathetic and compassionate humans can be towards the plight of suffering animals, such as stray dogs.

We then contrasted this compassion with the darker side of human-animal relations. In the second half of this chapter, we presented examples of direct and indirect negative human animal relations. We used the meat industry as an example of direct negative human animal relations. We described the vast scale of the killing that occurs in the UK. We then discussed the slaughterhouse industry, and showed how only a small proportion of people that work with animals are also responsible for their killing. In addition, we discussed the few empirical studies that have examined the psychological impact of killing animals for a living. Finally, we gave an overview of the large body of work exploring the psychology of meat eating. We looked at the profile of those who are more likely to eat meat (e.g., hyper-masculine, conservative men), and those who are less likely to eat meat (left wing, egalitarian women). We then discussed the meat paradox, and how the psychology of eating meat involves seeing meat animals as mindless animals beyond the realm of moral concern.

While this chapter has described human-animal relations and the psychological impact of these, there also exists a body of theoretical work that offers further psychological insights as to why these relations might exist in the way that they do. These psychological theories form the basis of the next chapter.

# Chapter Two: Psychological Theories of Human-Animal Relations

## 2.1 Chapter Overview

In the first chapter, we provided an overview of contemporary human-animal relations in the UK. In this chapter, we will provide an overview of the psychological theories that have been applied to human-animal relations, and describe how each theory falls short of answering whether human-animal inequality is foundational to human inequalities. We first describe Social Identity Theory which reveals how we think about the social categories of 'animals' and 'humans' has an impact on human-animal relations. We next show how the literature on stereotyping and prejudice has informed our understanding of human-animal relations, and how human-animal relations has in turn advanced the stereotype and prejudice literature. System Justification Theory is discussed which reveals the possible role of justifications in the exploitation of animals. We conclude the chapter with a Cognitive Dissonance Model of explaining morally troublesome human-animal relations.

## 2.2 Social Identity Theory

The social groups that we identify with, or distance ourselves from, in part define how we perceive ourselves and the social world around us (Tajfel & Turner, 1986; Tajfel, Turner, Austin, & Worchel, 1979). According to Social Identity Theory (SIT), people seek out positive social identities that improve their self-esteem by seeing one's ingroup in a more favourable light than other outgroups. Social Identity Theory is therefore an intergroup perspective by its very nature. Consequently, SIT is also relevant to human-animals relations. The terms 'human' and 'animal' create distinct social categories, and promote intergroup attitudes towards 'humans' and all other 'animals'. For example, recent research by Amiot and Bastian (2017) has shown that people's solidarity with animals in general is positively related to their moral concern for *some* animals. Conversely, emphasizing differences between humans and animals can foster group distinctiveness and facilitate dis-identification with animals (Amiot et al., 2017). In short, people's attitudes towards the social

categories of ‘humans’ and ‘animals’ are relevant to people’s moral concern for animals, and underline the relevance of social identity theory and self-categorization theory for human-animal relations.

### 2.3 Stereotype Content Model

A psychological theory that has gained significant attention in the past two decades is the Stereotype Content Model (SCM) (Fiske, Cuddy, Glick, & Xu, 2002). The SCM proposes that perceptions and treatment of others can be explained largely along the two dimensions of competence (efficacy, skill, creativity, confidence, and intelligence) and warmth (trustworthiness, sincerity, kindness, and friendliness) (Cuddy, Fiske, and Glick, 2008). According to SCM, social groups and individual members of social groups tend to be seen to have either high or low levels of both competence and/or warmth. For example, drug addicts are seen to be low in both competence and warmth; stay-at-home mums are seen to be both high in both competence and warmth; Asians are seen to be high in competence but low in warmth; and the elderly are seen to be high in warmth but low in competence (Cuddy, Fiske, and Glick, 2008).

The SCM has also recently been used to explore perceptions of animals along the same dimensions of warmth and competence. Research has shown that rats and mice are seen to be low in competence and low in warmth; pet animals such as cats and dogs are seen to be both high in warmth and high in competence; predator animals such as tigers are seen to be low in warmth but high in competence; and farm animals such as pigs are seen to be high in warmth but low in competence. These animal stereotypes are also predictive of behavioural reactions towards animals, in line with the Behaviour from Intergroup Affect and Stereotypes Map (BIAS Map) (Cuddy, Fiske, & Glick, 2007). Specifically, the Bias map suggests that the position of animals on the warmth dimension predicts whether the animal is protected (such as dogs because they are seen to be warm) or killed (such as foxes who are hunted). In addition, competent animals are thought to be worth preserving (e.g. elephants), whereas animals which are perceived to be incompetent (e.g. chickens) are treated with apathy and neglect by the public. The SCM has a

large body of empirical support from various labs around the world. For example, neuroimaging results show decreased activation in areas of the brain associated with social cognition, when participants are asked to think of people who are seen as low in both competence and warmth, such as drug addicts and the homeless (Harris & Fiske, 2006).

### 2.4 Speciesism and Dehumanization

The psychological and philosophical prejudice literature has informed our understanding of human-animal relations. More than simply being similar to each other, racism and speciesism are conceptually identical (Singer P. , 1995). Both racism and speciesism involve an intergroup 'us versus them' mentality; the distinctions between the ingroup and the outgroup are arbitrarily set by the oppressor. It is the oppressor who claims that (1) there is a difference between the two groups, and (2) that this difference is morally relevant. In the case of racism, the difference between the ingroup and the outgroup is often based on appearance (e.g., skin colour) and the behaviour of the outgroup (i.e., they are backwards, and we are not). Similarly, for speciesism, the difference between the ingroup and the outgroup is based upon appearance (i.e., they have wings) and the behaviour of the group (they fly, and we do not). Speciesism, like racism, represents motivated reasoning which both justifies and enables the ill treatment of other beings (humans or animals), allowing the oppressors to think of themselves in a positive light – they (humans or animals) do not matter because we are superior, and they are inferior. In addition, racism and speciesism are both forms of prejudice which involve hierarchical group thinking – we are superior and morally worthy, they are inferior and not morally worthy (Hodson, Kteily, & Hoffarth, 2014). In short, psychologists and philosophers have drawn on the human prejudice literature to shed light on the ill treatment of animals, which has in turn improved the prejudice and dehumanization literature.

### 2.5 Right Wing Authoritarianism

In addition to the specific prejudice of speciesism outlined in the prejudice literature, Right Wing Authoritarianism (RWA) has been shown to relate to human-animal relations. RWA is an individual difference measure

capturing the extent to which people are conventional, aggressive towards social deviants, and submit to authority (Altemeyer, 1981; 1988). Right Wing Authoritarians tend to be prejudiced towards outgroup members and particularly towards members of groups which are perceived to be dangerous or dissident (Whitley, 1999). For example, research has shown that RWA is strongly associated with prejudice towards drug users and drug dealers, violent criminals, terrorists (i.e., dangerous groups), people who criticize authority, people who protest, prostitutes and feminists (i.e., dissident groups) (Duckitt & Sibley, 2007). Right Wing Authoritarians also tend to be prejudice towards African Americans, Native Americans, and women in general (Altemeyer, 1998). Prejudice towards these groups reflects right wing authoritarians' worldview that the ingroup is competing with outgroups which threaten the social and moral fabric of society (Whitley, 1999). Research has also shown that people who are higher in RWA also support the exploitation of animals, and consume more meat than people who are lower in RWA. In addition, people higher in RWA also have more negative views of people who abstain from the meat-eating norm (e.g. vegetarians and vegans) and who therefore represent a challenge to the dominant meat-eating way of life.

**2.6 Social Dominance Orientation**

In addition to RWA, Social Dominance Orientation (SDO) is another individual difference measure of generalized prejudice that has informed research on human-animal relations. SDO captures the view that intergroup relations in society are inherently competitive. SDO also measures the preference for group-based hierarchy over egalitarianism, and the view that one's ingroup should be superior to, and should dominate, outgroups (Pratto, Sidanius, Stallworth, & Malle, 1994; Sidanius & Pratto, 2001). People who are higher in SDO tend to be prejudiced towards derogated outgroups such as unattractive people, racial outgroups, the mentally ill, immigrants, housewives, Arabs, and the unemployed (Duckitt & Sibley, 2007). Prejudice towards these groups reflects socially dominant peoples' worldview that the ingroup is competing with outgroups in a zero-sum game of dominance and submission. SDO is a key social psychological theory and individual difference measure

which captures generalized prejudice towards human outgroups and is relevant to human-animal relations because animals are another 'group' that people who endorse SDO justify exploiting (Costello & Hodson, 2014; Caviola, Everett, & Faber, 2018; Dhont, Hodson, & Leite, 2016).

### 2.7 Interspecies Model of Prejudice

Racism has been used throughout history to justify numerous atrocities, in numerous cultures (Sidanius & Pratto, 2001). A core aspect of racism is dehumanization – the denial of humanity to people of other races (Haslam & Loughnan, 2014). Racism and dehumanization have a long history together because prejudice towards racial outgroups has often been coupled with perceiving and treating human outgroups as less than human (Haslam & Loughnan, 2014). Dehumanization is concerning due to its association with moral concern: we reserve morality and respect for those we classify as 'human', and therefore perceiving or classifying other humans as non-human strips them of moral concern (Haslam & Loughnan, 2014). Racial dehumanization is therefore fundamentally tied to our perceptions and treatment of animals.

Over the last decade, the Interspecies Model of Prejudice (IMP) has empirically shown that prejudice towards humans is related to prejudice towards animals: the more negatively someone thinks of animals, the more likely they are to hold negative views of human outgroups (Hodson, Kteily, & Hoffarth, 2014). Drawing on SIT, a core aspect of the IMP is the belief in a human-animal divide – the belief that humans are distinct from, and superior to animals (Hodson, Kteily, & Hoffarth, 2014). In their seminal research, Costello and Hodson (2009) found that undergraduate Canadian students' beliefs that animals and humans were similar (i.e., rejecting the human-animal divide) was associated with immigrant humanization (i.e., seeing immigrants as more fully humans). That is, the less participants thought humans were distinct from animals (i.e., rejecting the human-animal divide), the less they dehumanized immigrants. In study 2 of the same paper, the authors manipulated human-animal similarity using editorials that either emphasized the similarities or emphasized the differences between humans and animals.

Having participants read editorials describing how animals were similar to humans resulted in greater immigrant humanization than participants that read about how humans were similar to animals, or the human-animal divide (Costello & Hodson, 2009).

This research suggests that the framing of comparisons is incredibly important, whereby the humanization of animals (i.e. animals are similar to humans) could have a positive bearing on the perceptions of outgroups, whilst the dehumanization of humans (i.e. humans are similar to animals) might not. Bastian, Costello, Loughnan, and Hodson (2012) replicated and extended this research and found that closing the human-animal divide by comparing animals to humans (but again not comparing humans to animals) improved Canadian undergraduates moral concern for marginalized outgroup members (Asians, Aboriginals, Black people, Muslims, and immigrants). Together, these first two studies reveal how closing the human-animal divide can have important benefits for seeing immigrants as more human, and for extending moral concern to numerous human outgroups who often experience prejudice (Bastian, Costello, Loughnan, & Hodson, 2012).

Additional research has shown that belief in the human-animal divide is present in children, and that ideological orientations usually used to consider human intergroup relations (such as social dominance orientation) are important predictors of animal attitudes. For example, Costello and Hodson (2014) found that beliefs in the human-animal divide are present among White Canadian children aged as young as 6-10 years old, and that their beliefs in the human-animal divide predicted dehumanization of Black children. In addition, the children's' parents level of SDO predicted the children's dehumanization of other children indirectly through the child's belief in the human-animal divide. This research shows neatly that the belief that humans are distinct from and separate to animals is developed from a young age in children. In addition, this research shows the impact that parents beliefs about human intergroup relations (as measured by SDO) can have on their children's beliefs about human-animal relations (which in turn predicts dehumanization of outgroups).

Taken together, these three studies show that raising animals up to the status of humans can improve humanization of human outgroup members such as immigrants and racial outgroups. Conversely, drawing attention to the ways in which humans are animal-like does not improve immigrant humanization. Finally, these three studies show the ways in which drawing a line and putting humans above animals has negative consequences for how we think about human intergroup relations. Importantly, the IMP has both drawn on, and informed the human prejudice literature by showing that speciesism is psychological construct that can predict the dehumanization of humans.

### 2.8 Social Dominance – Human Animal Relations Model

Another psychological theory that has advanced our understanding of human-animal relations is the Social Dominance – Human Animal Relations Model (SD-HARM). While the IMP documents the association between the human-animal divide and outgroup dehumanization, the SD-HARM model shows that human-animal and human outgroup perceptions are best explained by individual differences in SDO. Dhont, Hodson, Costello, and MacInnis (2014) first illustrated this with Canadian undergraduates when they showed that speciesism was related to ethnic prejudice towards Black people, ethnic minorities, Aboriginals and Muslims. Importantly, they subsequently illustrated that this correlation was non-significant when controlling for individual differences in SDO. Importantly, alternative models such as ethnic prejudice explaining the link between speciesism and SDO were also tested and ruled out. That is, it was the group-based hierarchies in both speciesism and ethnic prejudice that share their roots in SDO.

Extending their work, Dhont, Hodson, and Leite (2016) conducted three studies (in the UK, USA, and Belgium) that tested their SD-HARM model which posits that it is SDO in particular that best explains the link between speciesism and racism. They found in all three studies that SDO – as opposed to RWA – is the key factor connecting racism and speciesism. Dhont, Hodson, and Leite (2016) also conducted their own meta-analysis across their three studies providing additional support for their model. Taken together, the SD-HARM

shows empirically that attitudes towards animals and human outgroups may share a common origin in individual differences in SDO. However, the SD-HARM model is not equipped to explain why people who are low in SDO, indeed people who are not racist nor prejudice, still participate in morally troublesome behaviour such as consuming meat. It is likely that the SD-HARM models prediction that reducing SDO will reduce racism and speciesism would work for people with pre-existing high levels of SDO, but not for people with pre-existing low levels of SDO who still consume meat and other morally troublesome products.

### 2.9 System Justification Theory

Another psychological theory that explains negative or unequal intergroup human relations – but that does not centre on active prejudice – is System Justification Theory (SJT) (Jost, Banaji, & Nosek, 2004). Whereas RWA and SDO posit that people hold worldviews that benefit the self and the ingroup, and which constitute outgroup prejudice (Altemeyer, 1988; Sidanius & Pratto, 2001), SJT posits that another key factor of unequal intergroup relations is the tendency for people to justify the status quo, irrespective of whether they benefit from it or not (Jost, Banaji, & Nosek, 2004). SJT theorists argue that people are motivated to rationalise and justify their position in society and use System Justification to explain their (positive or negative) place in the world (Jost, Banaji, & Nosek, 2004). SJT is therefore relevant to human-animal relations because people might use it to justify their participation in the widespread exploitation of animals. In two large samples (N = 1500; N = 2119), Hoffarth, Azevedo, and Jost (2019) found that system justification mediated the relationship between political conservatism and animal welfare attitudes, even after controlling for SDO. In study 2, they found that political liberalism was associated with support for animal welfare and less speciesist attitudes, and that system justification mediated these results. Due to the justifications people have for the exploitation of animals, System Justification Theory has provided a useful additional ideology which helps explain the relationship between human relations (e.g., political conservatism) and human-animal relations (e.g., animal welfare attitudes). Recently, Caviola,

Everett, & Faber (2018) found that speciesism was positively related to both racism and sexism in American participants. They replicated the IMP and SD-HARM finding that speciesism was related to two key ideological constructs associated with prejudice of humans (SDO and RWA), however, they also revealed that speciesism was positively related to System Justification Theory.

**2.10 Cognitive Dissonance Model of human-animal relations**

The final theory we discuss in this chapter draws on Cognitive Dissonance Theory (Festinger, 1957) and provides the best psychological explanation for eating meat. In a recent paper, a novel theory about the psychology of eating meat was proposed. It describes how deep the product-production disconnection goes, and how everyday people that think of themselves in a morally good light, are able to participate in the morally troublesome behaviour of eating meat (Bastian & Loughnan, 2017). Because most people are motivated to see themselves in a good light, when concerns about the welfare of animals is brought up, meat eaters face a moral dilemma and experience cognitive dissonance due to their wanting to eat meat (which necessitates harming animals) but not wanting to harm animals (Festinger, 1957). One way to reduce this dissonance is to stop eating meat. For most people, however, dissonance is reduced in (a combination of) four other ways.

Firstly, people tend to reduce cognitive dissonance from meat eating by denying animals the capacity to suffer – if animals cannot feel pain in the way humans do, then their suffering does not matter as much (Piazza & Loughnan, 2016). Second, people reduce dissonance by justifying their behaviour using the four N's of meat eating; it's (1) necessary, (2) natural, (3) normal and (4) nice (Piazza, et al., 2015). Thirdly, people justify their meat eating behaviour by emphasizing how responsible their meat eating is. They might limit their meat intake, or only eat certain types of meat (such as organic or free range, or alternatively only eat fish). In using these justifications, people begin to see their meat eating in a positive and moral light (Bastian & Loughnan, 2017). In addition, stereotypes that people who do not eat meat (i.e. vegetarians and vegans) are weight conscious, feminine and liberal, serve to discredit the

alternative. That is, people are more hesitant to change their meat eating behaviours as the alternatives are not as socially desirable.

The theory posited by Bastian and Loughnan (2017) is particularly interesting in that they outline how repeatedly reducing dissonance arising from eating meat can lead to an increase in the behaviour and can further embed meat eating into social norms. In effect, the immorality of meat eating begins to disappear (Bastian & Loughnan, 2017). For instance, the more normalized meat eating is in a culture, the less time and effort people have to spend dwelling on whether eating meat is immoral at all, and subsequently the more meat eating becomes habitual and does not evoke dissonance. That is, meat eating becomes entrenched in culture and becomes normalized, as it has in the UK (Bastian & Loughnan, 2017).

While there is a psychological disconnect between product and production, there is also a geographical disconnect which helps take the moral pressure off consuming meat. While there are good economic reasons why animal farms reside in the outskirts of town, there is no logistical reason why a slaughterhouse could not be on the main street on a city centre (Bastian & Loughnan, 2017). Indeed, the animal agriculture industry is an extremely wealthy industry and could easily afford to pay rent on the most expensive streets in a town centre (British Meat Processors Association, 2019). This would also be good advertising for the meat processing companies, as people would become more familiar with them over time. Slaughterhouses are of course kept as far away from places that sell meat (such as cafés, restaurants, and butchers) as possible, and for good reason. The geographical distance promotes psychological disconnect between meat and its animal origins. That is, slaughterhouses are kept geographically away from the sale of meat, in the hope that slaughterhouses are kept psychologically away from meat too. The geographical and psychological distance between meat and slaughter is an essential and lucrative aspect of the meat industry because the distance makes it easier for meat eaters to buy and consume meat without feeling conflicted about the consequences of their behaviour. The Cognitive Dissonant Account of morally troublesome behaviour is a theory with strong exploratory

power and one that can be used to explain numerous morally troublesome behaviours beyond the scope of meat eating.

## 2.11 Chapter Summary

The psychological theories we have mentioned contribute to the literature on human-animal relations in different and complimentary ways. For example, Social Identity Theory can explain why people think favourably about their ingroup (humans) and more negatively towards the outgroup (animals). In addition, the Stereotype Content Model predicts warmth/ competence attributions of animals; the Behaviour from Intergroup Affect and Stereotypes map differentiates between active prejudice determined from perceiving animals as cold and passive indifference towards animals determined from seeing animals as incompetent. Theories of generalized prejudice can explain why people who are socially dominant or conservative support animal exploitation; the Interspecies Model of Prejudice shows that racial dehumanization is related to the human-animal divide; the Social Dominance Human Animal Relations Model suggests that individual differences in Social Dominance Orientation connect prejudicial human and human-animal perceptions. However, despite their contributions, no existing psychological theories can predict whether human-animal inequality is foundational to human inequalities.

In addition, the psychological theories which draw connections between the treatment of animals and the treatment of people (IMP and the SD-HARM) both restrict their analyses of mistreatment of humans to discrimination of racial and religious outgroups in a national context. We maintain that there are broader ways of mistreating humans – beyond racial and religious discrimination – which may be connected to the mistreatment of animals. Accordingly, the third and final introductory chapter will provide an outline for a theoretical advancement in the psychology of human-animal relations.

# Chapter Three: The foundation of inequality

## 3.1 Chapter Overview

In this chapter, we discuss how there are human inequalities that may be related to the mistreatment of animals beyond the previously studied racial and religious discrimination. Cuddy, Fiske, and Glick's (2008) BIAS Map suggests that perceptions of warmth predict whether people will be welcomed and protected, or alternatively, seen as competition and treated with hostility. In addition to warmth, those high in competence are thought to be worth respecting because of their social status. Conversely, those low in competence are treated with apathy and neglect; they are seen to have low social status and are not worth protecting. The BIAS Map differentiates between active prejudice determined from warmth (i.e. towards groups seen as cold and unwelcoming, such as immigrants), and passive indifference determined from competence (i.e. towards groups seen as incompetent and low in social status, such as drug addicts or the homeless).

The previous psychological research on the connection between human-animal and human relations has only explored the relationship between human-animal relations and active human forms of prejudice. That is, active prejudice such as racism and prejudice towards religious outgroups in a national context. However, this chapter reveals that there are additional human relations, which are relevant to the study of human-animal relations, which take the form of passive indifference at both the national and international level. After providing two examples of passive human relations (the drug addict inequality and the Bangladesh inequality) which are similar to human-animal inequality, we then ask if both human-animal and human inequalities are conceptually similar. If so, is one foundational to the other? Finally, and crucially, we question whether reducing the foundational inequality could collapse the edifice of inequality itself.

## 3.2 The Drug Addict Inequality

Research shows that drug addicts are some of the most vulnerable and abused groups in the UK (Buchanan & Young, 2000). Drug addicts experience disproportionately more Adverse Childhood Experiences (ACEs). For

example, during childhood they are more likely to have experienced physical, sexual or emotional abuse, neglect, and are more likely to have lived in a household experiencing domestic violence, incarceration or illicit drug use (Brewer, Catalano, Haggerty, Gainey, & Fleming, 1998). Despite this increased likelihood of childhood trauma, as a group, drug addicts are systematically persecuted by the state (Buchanan & Young, 2000) and dehumanized by the public (Fiske, Cuddy, Glick, & Xu, 2002). In short, there is a widespread and systematic inequality between drug addicts and users, and those who consume legal drugs; an inequality that the Government promotes and the public is complicit in through their indifference to the plight of drug users and drug addicts (United Nations, 2005). In this section, we suggest that the widespread persecution and imprisonment of the drug addicted population constitutes a inequality similar to human-animal inequality outlined in chapter one.

There are many different types of drugs available for consumption, from those that are widely available and socially acceptable (e.g. alcohol), through to those that are controlled substances (prescription drugs), to those that are illicit and frowned upon (e.g. cannabis). These drugs are categorized as either legal (e.g. alcohol) or illegal substances (e.g. cannabis), but not necessarily because of how troublesome for society or for users these drugs are (Nutt, King, & Phillips, 2010; UK Home Office, 2007). For example, research consistently shows that alcohol (legal) is more problematic for society in terms of consequences for both users and society, than any illegal drug including heroin, amphetamines, cannabis, and ecstasy (Nutt, King, & Phillips, 2010). The divide between legal and illegal drugs is therefore not informed by empirical research (Nutt, King, & Phillips, 2010). The arbitrary classification of drugs as legal or illegal, alongside the persecution of those in possession of such ‘illegal drugs’ reflects a concerted effort on the part of the government, the media, the licit drug industry (e.g., the pharmaceutical industry and the alcohol industry) to promote the regular ingestion of some drugs (e.g. alcohol or prescription drugs), while demonizing the use and the users of other drugs (e.g. cannabis, cocaine or heroin) (UK Government, 2019). While there is a

considerable government effort to stop illegal drug use in the UK, the government's criminalization of drugs and attempt to curb drug use is relatively recent. People tried and even frequently used drugs in the UK throughout the 20th century. However, it was not until the 1980s following the introduction of the Misuse of Drugs Act 1971, the de-industrialization of Britain's labour intensive ship building and factory communities, and a switch from the upper to the lower classes taking drugs, that drugs actually became seen as a 'problem' for the UK (Buchanan & Young, 2000; Waley, 2005). In fact, it was the upper echelons of society; doctors, dentists, academics, physicians, and aristocrats who first demanded the importation of cocaine into the UK in the late 19th and early 20th centuries (Streetfield, 2002).

While there can be positive effects of using illegal drugs, such as the pleasant effects of consuming drugs recreationally or the recent increase in cannabis use to manage chronic pain, drug addiction is associated with numerous negative mental and physical health outcomes (Weaver, et al., 2003). For example, a systematic review found that the use of cannabis was dose-dependently associated with increased risk of psychotic symptoms (Moore, et al., 2007). Opiate users are at risk of developing blood-transmitted diseases, such as HIV and hepatitis, from sharing needles and having unprotected sex with infected drug users (Joe & Simpson, 1995; Zaric, Barnett, & Brandeau, 2000). Further, the cognitive impairment that can accompany drug use can impede decision-making and can cause aberrant behaviour (Wesley, Hanlon, & Porrino, 2011; Verharen, et al.). While those addicted to drugs may experience an array of ill mental and physical costs associated with their drug use, an unfortunate number of drug users also experience overdose-related deaths. Taken together, drug use is at the heart of thousands of deaths each year. In 2015 for example, there were 3000 reported drug related deaths in the UK (90% heroin overdose; 74% male deaths), up 50% from the 2000 deaths reported in 2006 (European Monitoring Centre for Drugs and Drug Addiction, 2019). There is also a significant crossover between drug addiction and homelessness, with many drug addicts also being homeless. It is likely

that both drug addiction leads to homelessness, and homelessness facilitates drug addiction (Galea & Vlahov, 2002).

In brief, after continued and escalated use, drug users can become addicted to drugs and suffer a host of negative mental and physical health outcomes (Brewer, Catalano, Haggerty, Gainey, & Fleming, 1998). Drug addicts therefore constitute a vulnerable human population that need help and support from the state – however, this is far from how drug addicts are treated in the UK. Although an increasing number of scholars see drug addiction as a health problem, and the World Health Organisation and United Nations have recommended that it is treated as such (World Health Organization, 2017), the UK government continues to deal with drug addiction as if it were a criminal problem (Buchanan & Young, 2000). The Misuse of Drugs Act 1971 and the Drug Trafficking Act 1994 are the main laws that regulate drug control in the UK. These laws distinguish between different classes of drugs (A, B, or C), each having different costs to people and society, and different legal penalties for possession or intent to supply the drug. The consequences for those caught in possession of these substances can include imprisonment. Ironically, being isolated from their normal social relationships in this way can lead to an increase in drug taking behaviour following release from prison (Buchanan & Young, 2000). Who then, are the drug addicts that police are imprisoning in their efforts to curb drug use in the UK?

Both drug use and drug addiction are more common among males in the UK (European Monitoring Centre for Drugs and Drug Addiction, 2019). For example, of the people seeking help for drug problems in England, 89% are male, and 74% of drug related hospital admissions are male (National Health Service, 2019). Beyond being male, there are additional individual differences, such as sensation seeking and impulsivity, that contribute to drug addiction in the UK (Le Bon, et al., 2004). More recently, Adverse Childhood Experiences (ACEs) such as living with an adult who uses drugs, experiencing neglect as a child, or being physically or sexually abused as a child, have all been shown to strongly predict the trajectory from recreational drug use to drug addiction (Dube S. R., et al., 2003; Gauffin, Vinnerljung, Fridell, Hesse, & Hjern, 2013;

Zarse, et al., 2019). The profile of the average drug addict; a vulnerable man that has likely experienced trauma and instability as a child, and has likely grown up in poor socio-economic circumstances. This is very different to the stereotype of the drug addict as a dangerous criminal that should be imprisoned (Buchanan & Young, 2000; House of Commons, 2018). Further, if drug addicts are using drugs to numb or comfort psychological pain experienced in their childhood, adolescence, or adult life (i.e. to self soothe), then they constitute a particularly vulnerable population who deserve to be treated with respect and dignity, not persecution and punishment.

**3.2.1 Dehumanization of drug addicts.** Just as the government stereotypes drug addicts as criminals, the public tends to do the same. Research shows that people dehumanize drug addicts and drug dealers by seeing them as less than human, and therefore beyond the realm of moral concern. Research suggests that people stereotype drug dealers as cold and incompetent; they lack warm interpersonal skills and intelligence (Fiske, Cuddy, Glick, & Xu, 2002). In short, drug addicts are seen to be less than human (Fiske, Cuddy, Glick, & Xu, 2002). In fact in the research, participants thought that drug dealers were three standard deviations below the mean of all other groups on a measure of warmth, underscoring that drug dealers were identified as the most unfriendly, poor intentioned and untrustworthy target group, more so than homeless people, welfare recipients, Muslims, and Black people (Fiske, Cuddy, Glick, & Xu, 2002).

Following the research on the dehumanization of drug dealers, the dehumanization of drug addicts has been measured using fMRI techniques. This research revealed that images of drug addicts (and the homeless) failed to elicit activation in the medial prefrontal cortex (mPFC), an area of the brain associated with social cognition (Harris & Fiske, 2006). In the same study, viewing pictures of drug addicts increased activation of the amygdala, suggesting that drug addicts not only fail to elicit social cognition, but additionally are seen to be disgusting (Harris & Fiske, 2006). Combined, this means that people in the UK see drug addicts as beyond the realm of moral

concern and therefore fail to recognise the plight of drug addicts, much like the apathy people have for farm animals in the UK.

Additional research on social connection has found that, compared to a control condition, experimentally inducing people to feel socially connected to others leads to the dehumanization of drug addicts (Waytz & Epley, 2012). The research suggests that peoples' attribution of mind towards drug addicts is in part related to how socially connected people feel, and the more people already feel connected to others, the less they feel the need to consider the minds and wellbeing of drug addicts. Other research has suggested that dehumanization of drug addicts is in part due to individual differences in motivation to avoid emotional exhaustion (Cameron, Harris, & Payne, 2016). In study 1, participants anticipated experiencing more emotional exhaustion from helping drug addicts compared to a homeless person, whereas study 2 experimentally manipulated emotional exhaustion and found that higher anticipated emotional exhaustion (compared to a control condition) was associated with dehumanization of drug addicts (Cameron, Harris, & Payne, 2016).

Taken together, these studies first reveal that the public dehumanizes both drug dealers and drug addicts; seeing them as incompetent and untrustworthy (Fiske, Cuddy, Glick, & Xu, 2002). In addition, research into the dehumanization of drug addicts reveals that drug addicts do not elicit the same level of social cognition that is elicited by other human groups (Harris & Fiske, 2006), and that the dehumanization of drug addicts is a form of motivated reasoning. People are more likely to dehumanize drug addicts when they already feel socially connected, and thus do not wish to seek out more social connections (Waytz & Epley, 2012), particularly when they feel as though connecting with drug addicts would be emotionally exhaustive (Cameron, Harris, & Payne, 2016).

**3.2.2 A concerted effort.** We began this section on the drug addict inequality by differentiating between legal and illegal drugs, and giving an overview of the rates of illegal drug use in the UK. We then outlined the health and legal consequences of drug use in the UK and described those who are

most likely to become addicted to drugs. We also provided four empirical psychological studies that demonstrate the dehumanization of drug dealers and drug addicts. We now consider how each of the parts covered in the previous sections comprise the drug addict inequality. We do this by illustrating the concerted effort by numerous parties (such as the government and the media) to persecute drug addicts in the UK. Over the past half century, the UK government has declared and executed a war on drugs. The reality of that failed campaign has been countless deaths (from violent crime and from overdoes), increases in the UK prison population, increases in the number of people in the UK who consume illegal drugs and increases in the number of drug addicts in the UK. One may ask the question then, why does the UK government continue its pursuit of waging war on drug users and drug addicts? While a comprehensive answer to that question is beyond the scope of this thesis, what is clear is that this human inequality has great similarities with human-animal inequality we discussed earlier.

Firstly, much like human-animal inequality, for most people the drug addict inequality is beyond the remit of their daily lives. While we may see a drug addict begging for money, or overdosed and unconscious on a UK pavement, for the most part, people can go through their day without witnessing the problem, never mind recognising the inequality. After all, a significant portion of the population (largely conservatives), tend to see drug addicts as a dangerous group of criminals, not a vulnerable group of people worthy of helping. The left leaning portion of the population is likely more sympathetic to drug addicts' plight, as they are more sympathetic to animals' plight, however sympathy only goes so far. For most people, on all sways of the political spectrum, drug addicts remain out of sight, and consequently out of mind. Just as most people do not stop and think about the suffering of animals, possible alternatives to that suffering, or how their behaviour contributes to that suffering; so too most people do not stop and think about the suffering of drug addicts, possible alternatives to that suffering, or how their behaviour contributes to that suffering. Unlike human-animal inequality whereby the consumption of animal products, such as meat, contributes to the

suffering of animals, it is peoples' apathy and indifference towards the suffering of drug addicts, indeed their lack of behaviour, which perpetuates the drug addict inequality.

Secondly, just as human-animal inequality is perpetuated by people who have a stake in the status quo (such as the meat industry), many people benefit from drug addict inequality. Specifically, some people in the legal drug industry (i.e., the pharmaceutical industry, and the alcohol industry) have extremely high stakes in keeping the classification of drugs just as they are. Because people purchase their legal drugs to provide the relief or comfort that might be otherwise provided by illegal drugs, the alcohol and pharmaceutical industries have a stake in maintaining the war on drugs. In addition, conservative governments are motivated to keep drug classification and drug laws as they are (if not stricter) to please conservative voters that are more likely to dehumanize and stereotype drug addicts as dangerous and unhelpful criminals that 'are simply breaking the law and need to be punished' (Altemeyer, 1981). Make no mistake, the drug addict inequality, much like human-animal inequality would be difficult to change in the UK. Nevertheless, the way we treat drug addicts – or more accurately how we as a society fail to properly care for drug addicts – constitutes a widespread inequality, whereby a vulnerable population are unjustifiably persecuted by the government, all the while the public stands back and does little to intervene. Indeed, as we saw in chapter one, people are more likely to donate money to sick cats and dogs in the UK than to humans that are addicted to drugs (Charities Aid Foundation, 2019).

### 3.3 The Bangladesh Inequality

In the previous section, we illustrated how the persecution of drug addicts constitutes a widespread inequality that is similar to human-animal inequality. However, like the previous research connecting human and human-animal relations, the drug addict inequality is also a national inequality. In extending the theorizing on human-animal relations, we now consider the ways in which the UK human-animal inequality is related to an international inequality.

Most, if not all, people in the developed Western world regularly consume products produced overseas, and more often than not, produced in developing countries. Usually, people are completely unaware of the production process of those products (Cadwalladr, 2019). For example, when we purchase clothing, mobile phones, computers, cars, or even when we fill up the fuel tank of our cars, we know little, if anything, about how that product came to be (Rank a Brand, 2019). Specifically, we do not know the suffering and harm required to produce the products we purchase (Transparency International, 2019). There are of course undoubtedly benefits along the way of production as well (such as providing employment), however, these are well considered in the literature on sustainable consumption (Siddiqi D. M., 2009). While there are many different examples of morally troublesome consumption, we use the example of the clothing industry in this thesis, with a focus on the Bangladesh clothing industry. The aim of this section is to illustrate the conceptual similarities between human-animal inequality and the inequality apparent in the Bangladeshi clothing industry.

Like meat consumption that exploits animals, people can simultaneously think of themselves as morally good people, and can have positive attitudes towards foreigners, all the while indirectly exploiting third world labour (Bastian & Loughnan, 2017). In this way, consuming morally troublesome products mirrors the meat paradox we outlined in chapter one. For example, both the consumption of clothing and meat can cause unnecessary suffering to millions of living beings (or billions in the case of the meat industry). Whilst animals in factory farms face poor, stressful conditions, the same is true for those who work in sweatshops: sweatshops are generally characterised by very unsavoury and unsanitary conditions, poor lighting, poor ventilation, and are generally stressful and very uncomfortable (Ahmed, 2004).

Both the consumption of clothing and the consumption of meat is driven by developed countries around the world, such as the UK (War on Want: Sixty Years Fighting Global Poverty, 2019).Unlike direct forms of violence, the consumption of clothing and meat is not motivated by the hatred of the groups that will suffer. Instead, the industries continue to thrive due to passive

indifference (Cuddy, Fiske, & Glick, 2008). More specifically, because of the way in which the animal agriculture and the clothing industry operate, there is a concerted effort by the industries to shield the reality of the production of both meat and clothing from consumers; the product-production disconnect. However, unlike the psychology of meat eating, there is very little empirical psychological research on attitudes towards sweatshop workers, the psychological profile of people who purchase sweatshop clothing, or the psychology of purchasing and wearing sweatshop clothing.

**3.3.1 Fast Fashion.** The fashion industry is the third largest industry in the world, behind the food and technology industries (Fashion Revolution, 2019). Altogether, fashion is a £32 billion industry for the UK (UK Parliament, 2019). People in the UK consume clothing at rates higher than anywhere else in Europe, and the UK fashion industry employs around one million people, largely working in retail clothing stores (UK Parliament, 2019). The way fashion is produced has changed in the past few decades. Once an industry characterized by the production of high quality garments made to last, the advent of fast fashion in the 1980's saw the development of cheap, low quality garments, manufactured as fast as possible (hence the name 'fast fashion') (UK Parliament, 2019). This clothing is often purchased in the developed world (including the UK) with the intention of it only being worn a few times, or possibly only once, before being thrown away (Fashion Revolution, 2019). The production of fast fashion – or disposable fashion as it has also been termed – is particularly concerning due to the consequences it has on working conditions and the environment. Fast fashion is produced in sweatshops – textile manufacturing plants, usually producing clothes, shoes, and outdoor equipment such as tents and backpacks – often in developing countries where labour is plentiful and (perhaps unethically) cheap, land is inexpensive, and environmental and workers protections are either non-existent or not enforced (Fashion Revolution, 2019). While both the human and environmental consequences of the global fashion industry are concerning, we will focus on the human consequences; though environmental considerations are important, such as the amount of water used for farming cotton, or the

chemicals spilled into waterways from the dye in clothes (UK Parliament, 2019), they are beyond the scope of this thesis. While there is a fair amount of research describing the positive benefits of sweatshop labour to developing nations, such as providing work for women, increasing GDP, providing innovation and economic development (Siddiqi D. M., 2009), the negative consequences of sweatshops are most relevant to this thesis.

**3.3.2 Bangladesh Clothing Production.** The Bangladesh garment industry began manufacturing clothes for export in 1976, after Bangladesh (then East Pakistan) won its independence from Pakistan in 1971 (then West Pakistan) (War on Want: Sixty Years Fighting Global Poverty, 2019). Following the deregulation of markets, privatisation of industry, and the country opening up to foreign investment, the garment industry in Bangladesh skyrocketed. The industry currently stands at about 80% of total exports for the country, and today is the world's second largest exporter of clothing, following China (The New York Times, 2019). In terms of numbers, there are approximately 5000 sweatshops in Bangladesh. In terms of humans, approximately 3 million people (85% female) work in the garment industry, with the vast majority working in exploitative sweatshops. These women work long, 12-16 hour days, and often 6-7 days per week, for very little money. For example, the average monthly wage for a woman making clothes in Bangladesh (to be sold in the UK), is about £20-£30; this is even low compared to the local living wage.

Many Bangladeshi women begin working in sweatshops at a young age, leaving school before their tenth birthday to support their families (UK Parliament, 2019). The early age of beginning work in Bangladesh contributes to the very low literacy level in sweatshop workers; in one study of 1000 women, only 22% had finished secondary school (War on Want: Sixty Years Fighting Global Poverty, 2019). While some Bangladeshi children work in sweatshops to help their family financially, other young girls are kidnapped and trafficked into the fashion industry, a concern that the UK government is aware of (UK Parliament, 2019). In addition to poor working conditions, poor pay, and child slavery, Bangladeshi women and girls also face harassment and violence at work, with 70% reporting being sworn at during work; 40% being beaten or

hit in the face at work; 30% reporting being touched inappropriately at work; and 30% of women reporting threats of being forced to undress in front of their male bosses as a punishment. In summary, women working in sweatshops in Bangladesh work long, miserable hours, in hostile conditions, are subject to sexual and physical abuse, and are scared to leave for fear of their economic situation (Synder, 2010). The cramped working conditions in the Bangladeshi garment industry, alongside the industries negligence towards the welfare of the garment workers came to a head on the 24th April 2013, when a large building containing multiple sweatshops collapsed, killing 1134 people, and injuring a further 2500 people (UK Parliament, 2019). Just as alarming as the unfortunate deaths of these victims of the Bangladesh sweatshop industry, is that the sweatshops produced clothing that likely supplied the UK market (UK Parliament, 2019).

The meat paradox revealed that we consume meat from animals we deem mindless and beyond the realm of moral concern. However, regarding the consumption of morally troublesome clothing from sweatshops, there has been no empirical psychological research on perceptions of sweatshop workers. It is therefore unknown whether people are conscious of where their clothing is made, or whether they are willing to consume clothing from countries whose inhabitants they can dehumanize. This could be an interesting line for future research but unfortunately was beyond the scope of this research. Of course, Bangladeshi people also consume clothes, and the UK also produces clothing (and even has its own history of sweatshops), but largely the clothing industry today is driven by consumption of clothing in the developed world, that was produced in developing nations (UK Parliament, 2019). Given the scarcity of work on perceptions of people who produce sweatshop clothing, this thesis provides an important contribution by examining another group of vulnerable people in society whom are oppressed.

**3.3.3 UK Clothing Consumption.** Due to the grey areas surrounding the definition of a sweatshop, there are no figures on the number of garments produced by sweatshops that are purchased in the UK. Similarly, the definition of a factory farm is elusive and as such the line between factory farmed meat

and ‘ethically sourced’ is blurred. As a result, there is no information available that breaks down meat consumption by source. This is not entirely unintentional, as it suits both industries for the customer to be unaware of the origin of the product they have purchased. Despite this, it is safe to say that the vast majority of clothing purchased and worn in the UK comes from sweatshops (UK Parliament, 2019). Consequently, it is useful to look at total consumption of clothing that gives an indication of sweatshop consumption. Women are the main drivers of the demand for sweatshop labour in terms of the number of items of garments purchased (Statista, 2019). In 2018, UK women purchased 1 billion items of clothing, comprised of 57 million jackets; 183 million dresses; 203 million blouses; 201 million sweatshirts; and 321 million pairs of trousers (Statista, 2019). In comparison, UK men, purchased half of what women purchased in 2018.

Though we know that women consume more sweatshop clothing than men, there are also demographic and psychological characteristics that make people more likely to consume sweatshop clothing. For example, research in the fields of sustainability and decision making suggests that there are ‘socially responsible consumers’ who are interested in where their products come from, and whether they are fair trade or sustainably sourced. However, it is estimated that these consumers make up 30% of the population at most (Roberts 1995). These socially responsible consumers tend to be well-educated, middle aged with a high income, and can therefore afford to pay the higher prices that often accompany more ethically produced goods (Carrigan & Attalla 2001). Socially responsible consumers tend to have stronger feelings of obligation and accountability towards others, which can influence their purchasing decisions (Shaw and Clarke 1998). They also tend to be more liberal and more environmentally friendly, and believe that their individual choices have a prosocial impact (Roberts, 1995). They are also more altruistic (Koschate-Fischer, Stefan, & Hoyer, 2012), more socially conscious (Auger, Devinney, Louviere, & Burke, 2008), and more concerned with child labour and fair wages (Öberseder et al. 2011). Because of their concern with production, socially responsible consumers are more likely to seek out information about clothing

companies to find out whether they are supplied by sweatshops (Cherrier, 2007).

However, while there is evidence that there exists a profile of the socially responsible consumer, there is no empirical evidence that illustrates to what extent socially responsible attitudes have a reliable impact on decisions to consume morally troublesome products (Beckmann, 2007). The literature shows that even socially responsible consumers still consider price, quality, and the style of products, and might still consider purchasing the 'unethical' product, even if there was an ethical alternative. For instance, if the price or the style of the ethical product was unsuitable, or if they were unconvinced by retailers that say their clothing is 'ethically produced' (Mohr, Webb, & Harris, 2001).

In the meat paradox, we described the psychological mechanisms that help people to reduce dissonance that arising from the consumption of meat. Similarly, there are psychological mechanisms that facilitate the purchase and consumption of morally troublesome products such as sweatshop clothing. Like the meat paradox, people who consume sweatshop clothing likely do so despite having no negative feelings towards the workers, and likely have a host of justifications at their disposal to reduce any dissonance that arises from consuming clothes produced in this unethical way. In addition, the consumption paradox is primarily reduced by the private sector, who do their best to make their customers feel good about their morally troublesome behaviour (Bastian & Loughnan, 2017). We will now discuss how dissonance may be reduced by the individual, followed by how dissonance reduction is outsourced.

Like the meat paradox, people likely hold a suite of psychological defence mechanisms to reduce the dissonance that arises from the morally troublesome consumption of fast fashion. However, there is no empirical research aimed at exploring the justifications people might give for consuming sweatshop clothing. Despite this, we can speculate as to what types of justifications people might give. We think that the justifications that people would use to purchase sweatshop clothing would concern the economic and

social benefits sweatshops can bring. For example, people are likely to reference the benefits that sweatshop factories could bring to national economies and the economic benefits that purchasing clothing would bring to the fashion industry in the UK. Further, people might argue that sweatshops can provide economic opportunities and the subsequent empowerment of women who work there, in addition to providing jobs for people working in the UK. Moreover, similar to the 4N's which people commonly give to justify eating meat (Piazza, et al., 2015) (i.e., that eating meat is natural, normal, necessary, and nice), it is also likely that people would justify their consumption of sweatshop goods in a similar fashion. That is, they would likely say that purchasing sweatshop clothing is necessary and normal, and that having new clothes is nice (Campbell, 1997).

For the everyday shopper, it is likely that industry and social norms alleviate the need for exercising dissonance reduction strategies, because modern society is set up in such a way that consumers do not have to experience dissonance in the first place. Whether someone is buying meat or shopping for clothes, the shops that sell these products are very careful in what they associate their products with at the time of purchase (Bastian & Loughnan, 2017). Both the sale of meat and the sale of clothes is associated with the happy consumer – in both clothing stores and supermarkets, you will find images of people consuming the products, but never the reality of production (Bastian & Loughnan, 2017). Whereas industries like vegetable farmers, or ethical clothing manufactures would be proud of the production and processing of their goods, the clothing stores would never advertise the sweatshops, nor would the meat industry advertise the factory farms.

**3.3.4 Three caveats.** There are three important differences between the consumption of clothes and the consumption of meat. In meat consumption, the animals are the product, and so while perceptions of meat and animals are psychologically disconnected, they are not completely removed, as most people know that beef comes from cows, pork comes from pigs, and poultry comes from chicken. It is noteworthy that we have names for meat products such as beef, pork and poultry so that we can talk about meat

without even mentioning the animal origins of the meat. However, with sweatshop clothing, the product and production may be even more psychologically disconnected. That is, if we buy clothing but do not look at the tags, then we have no idea what country produced that garment. Consequently, our perceptions of sweatshop workers in Bangladesh are likely to be psychologically distinct from our attitudes towards sweatshop clothing, perhaps even more so than the disconnect between attitudes towards animals and attitudes towards meat. For example, some people may not even be aware that Bangladesh produces clothing, let alone has numerous sweatshops that supply the fashion industry in the UK. Therefore, people do not need to dehumanize Bangladeshis or have prejudice towards them to justify harming them – they might not even realise they are doing it. They can purchase sweatshop clothing from Bangladesh without knowing anything about its origins, and thus without feeling morally conflicted at all.

Clothing consumption is also different from meat consumption in that people are constantly wearing clothing in public, and so while meat eating happens for a short time during a meal, clothes are a constant in social life. Because clothing is so prevalent in society, even more so than meat, it is even easier for it to become normalized. However, we might always see clothing but we never see the factories. It is because of this disconnect between product and production, and because of the pervasiveness, that morally troublesome products like meat and clothing go unchecked on our moral radar. We think morally about stealing clothes, or borrowing clothes, or giving clothes to charity – all things that we may do ourselves - but because the factories are out of sight, the victims are out of mind for most of us, and we do not see purchasing sweatshop clothing as an immoral action.

The third and perhaps redeeming feature of the UK fashion industry is that the UK parliament has acknowledged the damaging effects it can have, and the UK's role in perpetuating that industry. In 2015, the UK signed up to the United Nations sustainable development goals, one of which (number 12) is to ensure sustainable consumption and production patterns. The UK government has called into question many large UK companies, and is vocal

about reducing the UK's involvement in the sweatshop industry. Therefore, unlike the animal agriculture industry, the UK government has positioned itself as a critic of the fast fashion industry. Thus, the concerted effort to promote the global fashion industry is one promoted by the media, private sector, the consuming public of the UK, and the sweatshop owners overseas, but not the UK government.

To sum, we have shown how conceptually similar the drug addict and Bangladeshi sweatshop inequalities are to human-animal inequality. We have given an overview of the drug addict inequality, and shown the ways in which the general public's indifference to the persecution of drug addicts is similar to the public's indifference to the exploitation of animals. We then gave an overview of the Bangladesh clothing industry and the Bangladeshi people who are exploited by that industry. Finally, we discussed the conceptual similarities between the indifference people have towards consuming sweatshop clothing, and the indifference people have towards consuming meat. We now spend the remainder of this chapter illustrating what these conceptual similarities might mean.

### 3.4 The Foundation of Inequality

It is possible that, beyond conceptual similarities between human-animal and human inequalities, the psychological mechanisms driving these processes are the same or are overlapping. For example, both the drug addict inequality and human-animal inequality are left unchecked by an apathetic public who are indifferent to the suffering of these groups in the UK. In addition, both animals and drug addicts are groups of individuals that people would not normally harm directly, and we also maintain that we believe that people who are indifferent to the suffering of animals or drug addicts are often kind and considerate people in everyday life. Unfortunately, both animals and drug addicts are seen to be lacking humanity; they are seen to be mindless beings that are not worth thinking of, or helping; their suffering is not as important as our suffering.

We have also shown how conceptually similar the Bangladesh sweatshop industry and the animal agriculture industry are, whereby both

industries involve the exploitation of vulnerable groups for the benefit of the business owners who profit, and the consumers who can purchase cheap products. We have shown that only a minority of people directly oppress both animals or sweatshop workers, and that the systems are perpetuated in large part by the indirect role that consumers play in demanding cheap products (meat and clothing), and the indifference they have towards methods of production. We think that most people who consume sweatshop clothing are also kind and considerate people in everyday life, and that the consumption of those goods is not a reflection of prejudice, but indifference. In fact, we would expect to see the consumption of sweatshop clothing coupled with positive attitudes towards Bangladesh sweatshop workers – most people do not consume morally troublesome products because they have animosity towards those whose labour is exploited, but rather most people simply fail to consider them at all. We have also suggested that we believe consuming sweatshop clothing is only an example of a wider phenomenon of consuming morally troublesome products. Finally, we outlined how society is set up in such a way that consumers seldom experience dissonance from purchasing morally troublesome goods, and that clothing consumers, like meat eaters, likely have a suite of dissonance reduction strategies at their disposal.

Beyond similarities, it is possible that the psychological processes behind the human-animal and human inequalities reinforce each other: if the lesson learnt from navigating the meat paradox is that preferences for meat are worth more than the life of an animal, what might this do for my preference in clothing? If I can justify an animal being killed just because I like the taste, then it is likely that I can rationalise leaving a drug addict passed out on the street without concern for their welfare: if I did not directly harm anyone then I am still a morally good person. The consequences of such a connection between these inequalities may be that the support for one inequality could inadvertently perpetuate the other. Previous research has shown that challenging the human-animal divide can reduce both speciesism and prejudice towards racial and religious outgroups. However, this previous research has not fully explored whether human-animal relations are

foundational to human relations because they have not tested their hypotheses in the alternative direction: examining whether challenging human inequality also has a positive impact on human-animal relations.

Identifying the foundational inequality would be an important theoretical advance for the psychology of human-animal relations. There are many different academics, artists, activists, and many others who are trying to improve the welfare of vulnerable human populations – but what if their efforts are hindered by human-animal inequality; what if efforts to improve the moral concern towards vulnerable human populations are being eroded by the apathy we exercise when we consume animal products? Or perhaps the foundation of inequality could be our apathy towards humans? Is our apathy towards animals driven by our apathy towards vulnerable human populations? While each are plausible, we hypothesize that it is human-animal relations which are foundational to human inequalities because human-animal inequality is long-lasting, and the most violent inequality found all around the world.

By foundational, we reasoned that people's attitudes towards many inequalities would hinge off one central (or foundational) inequality that they use as a psychological reference for the level of care they give to various groups in society. In other words, the 'foundational' inequality could also mean a 'guiding' inequality which guides the relative level of concern for other inequalities on a hierarchy of concern. The foundational theory presupposes that attitudes towards various inequalities are connected, either in a cognitive network or cognitive hierarchy. Upon reflection, we appreciate that this was quite an assumption to make, and future research could in fact explore whether people do cognitively represent various inequalities in such a fashion.

Nevertheless, if it is possible to identify that one inequality is foundational to other inequalities, then efforts to reduce systematic inequality can be better targeted. We then might see a domino effect whereby support for other inequalities are inadvertently reduced through the reduction of support for the foundational inequality.

We thought that the foundational hypothesis was a theoretically plausible one, and potentially better approach than the existing alternative of the SD-HARM model (Dhont, Hodson, & Leite, 2016). As outlined in Chapter 2, the SD-HARM model proposes that the latent third variable of SDO is foundational to both animal and human forms of prejudice. However, we hypothesized that it is more likely that there is an inequality (i.e. human-animal inequality) which is foundational to other inequalities for 2 main reasons. First, as mentioned above, we hypothesized that support for inequalities were cognitively connected to each other in such a fashion that there would be one form of inequality which support for other inequality would hinge off. In other words, we hypothesized there would be a 'guiding' inequality which people use as a cognitive reference to infer their support for other inequalities. Secondly, we reasoned that the SD-HARM model is theoretically limited and cannot explain the behaviour of those people who are low in SDO and yet are still apathetic to the plight of others (such as drug addicts and sweatshop workers). It is important to note that those who are low SDO are a sizable portion of people for which the SD-HARM model does not accurately predict their concern for various forms of inequality. Therefore the SD-HARM's blanket approach to inequality (i.e. using generalized prejudice as the key predictor) is limited in its usefulness because it simply does not explain why people who are not overtly prejudiced (e.g. low SDO people) still participate in widespread inequality such as the treatment of animals and drug addicts. However, we did acknowledge that SDO was an important variable to consider in this topic on human-animal and human inequalities. We therefore chose to measure SDO in all our studies so we could see the effect of the manipulations on support for inequality whilst holding constant individual differences in SDO. We chose to use SDO as a covariate instead of a moderator so that we could first identify whether the foundational effect was present when holding SDO constant. we simply wanted to first isolate the (any) effect of the manipulations on support for inequality as a first step in this line of research. We appreciate the usefulness of using SDO as a moderator and suggest that research could

benefit from examining SDO as a moderator in research on human-animal and human inequalities in the future.

### 3.5 Hypotheses

In this research, we have both correlational and experimental hypotheses. Using correlational analyses, we can determine whether people who support human inequalities are also likely to support other human, and human-animal inequalities. We expect that support for all the human and human-animal inequalities that we measure will be positively correlated. That is, people who are likely to be indifferent to the suffering of one human group are also likely to be indifferent to the suffering of another human group. In addition, people who are indifferent to the suffering of humans are also likely to be indifferent to the suffering of animals. Our foundational hypothesis will examine whether support for human-animal inequality is a better predictor of support for human inequalities, than other human inequalities. We think human-animal inequality will be foundational to human inequalities because of the severity of human-animal inequality: animals must be killed for meat, but people do not have to be killed to exploit their labour, and so human-animal inequality is inherently more violent.

To further examine whether human-animal inequality is the foundational inequality, we also have an experimental foundational hypothesis. Because previous research has suggested that challenging people's human supremacy beliefs could be a fruitful avenue to explore in human-animal relations research (Hodson, Kteily, & Hoffarth, 2014), we will challenge participants' beliefs in human supremacy over animals, and then measure their endorsement of the human-animal and various human inequalities. We will also challenge participant's beliefs in supremacy in a human population that is oppressed, and measure endorsement of the same human-animal and human inequalities. We will find empirical support for our experimental hypotheses if we find that challenging human supremacy can reduce the endorsement of both human-animal and human inequalities; and if we also find that challenging a form of human supremacy does not reduce endorsement of human-animal inequality. To be more specific, the pattern of results that would confirm the

hypothesis would be both: a) challenging human-animal supremacy would reduce support for both human-animal inequality and human inequalities; and b) challenging human-human supremacy may reduce support for that human inequality, but it would not also reduce support for human-animal inequality.

However, we will not have found empirical support for our hypotheses if we find that challenging human supremacy can mitigate endorsement of human-animal inequality, or if challenging human supremacy over animals fails to reduce the endorsement for human-animal inequality. To be more specific, the pattern of results that would disconfirm the foundational hypothesis would be a) challenging human-animal supremacy may reduce support for human-animal inequality but it would not also reduce support for human inequalities; and b) challenging human-human supremacy would reduce support for that human inequality, and it would also reduce support for human-animal inequality. Further, the pattern of results reflecting neutral support for the foundational hypothesis would be the occurrence of either (a) or (b):

a) challenging both human-animal and human-human supremacy translated to a downstream reduction in support for inequality (i.e. reducing human-animal supremacy reduced support for human-human inequality AND reducing human-human supremacy reduced support for human-animal inequality).

OR

b) challenging neither human-animal nor human-human supremacy translated to a downstream reduction in support for inequality (i.e. reducing human-animal supremacy DID NOT reduce support for human-human inequality NOR DID reducing human-human supremacy reduce support for human-animal inequality).

We used a pilot study to develop a measure of support for both human-animal and human inequalities, as discussed in the next chapter.

# Chapter Four: Pilot Studies

## 4.1 Introduction

In chapter 4, we present two pilot studies. The overall goal of chapter 4 was three-fold. First, the pilot studies tested which human inequalities correlated most strongly with support for human-animal inequality. To do this we aimed to develop a scale which could be used to capture individual differences in the extent to which people endorse both human and human-animal inequalities. The scale we developed in the pilot studies would then be used as the dependant variables in the subsequent experimental chapters (5-8).

Second, the pilot studies also tested the correlational foundational hypothesis. That is, we wanted to examine whether attitudes towards human-animal inequality were foundational (stronger predictors than endorsement of other human inequalities) to human inequalities. Third, we wanted to compare the means and standard deviations of the subscales to identify human inequality which people had the least concern for. Doing so would identify the ideal human group to test our experimental foundational hypothesis in chapter 4.

There are existing published measures that we could have used in this thesis; however, we did not for the following reasons. First, to the best of our knowledge, there is no published measure of endorsement for 'inequalities' for both humans and animals. Second, the existing measures of prejudice towards animals (e.g., speciesism measures; Dhont, Hodson, & Leite, 2016); women (e.g., sexism measures; Glick & Fiske, 1996); or racial groups (e.g., racism measures; Henry & Sears, 2002) are not comparable in that they use domain specific questions (Costello & Hodson, 2009). For example, a measure of speciesism reads, 'The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped" (Dhont, Hodson, & Leite, 2016), whereas a measure of hostile sexism reads, "Feminists are making reasonable demands" (Glick & Fiske, 1996). However, these are not comparable measures as the former (the speciesism item) questions whether oppressing animals unnecessarily is justifiable, and the

latter (the hostile sexism item) questions how reasonable the claims of feminists are. Although these are both interesting items that are part of important measures, in determining whether human inequalities are correlated to human-animal inequality, it is important to be testing the inequalities at the same level of abstraction. We therefore wanted to develop a measure that could be adapted to both human-animal and human inequality. In short, we wanted the scale to be face-valid and unambiguous, relatively short in length, and able to capture people's endorsement of various (human and human-animal) inequalities.

## 4.2 Pilot Study 1

### 4.2.1 Introduction

The purpose of pilot study 1 was two-fold. First, we wanted to examine whether the way people thought about human-animal inequality was comparable to the way they thought about human inequality. To do this we sought out to create a scale that captured participants' endorsement of inequalities. Second, we also wanted to correlate these measures and examine whether human-animal inequality was a stronger predictor of human inequalities than was another system of human inequality (correlational foundational hypothesis).

To begin, we had to choose which human inequalities we would use in the pilot studies. Human inequality needed to be comparable to human-animal inequality. In other words, human inequality needed to be psychologically as similar as possible to human-animal inequality. Evidence of this would be found in the same items comprising the principal component of each scale.

Perhaps two of the most poignant human inequalities that spring to mind are gender and ethnicity. Both men (Wollstonecraft, 1792) and white Europeans (Pratto, Sidanius, Stallworth, & Malle, 1994) have historically used notions of supremacy in their justification of oppressing women and ethnic others, respectively. In addition, both inequalities between gender and ethnicity share historical parallels with human-animal relations (Pratto, Sidanius, Stallworth, & Malle, 1994). For example, historically, women (Hacker, 1951), and ethnic minorities (Pratto, Sidanius, Stallworth, & Malle,

1994) were seen by many as second class citizens and denied human rights, similar to how most animals are currently treated today (Singer, 1995). In addition, the existing literature on the psychology of human-animal relations has posited that both gender (Adams, 2015) and race (Dhont, Hodson, & Leite, 2016) are tied intrinsically to the subjugation of animals. We therefore chose to use gender and race in our first pilot study. Because we thought the way people think about the male-female inequality or the white Europeans-ethnic minority inequality stems from the way people think about human-animal inequality, we hypothesize that:

a) Endorsement of the human-animal and human inequalities would be correlated across participants, and content correlated as measures as shown in the inter-item correlations and PCA results.
b) Endorsement of human-animal inequality would be a stronger predictor of the endorsement of the male-female inequality, than would the white Europeans-ethnic minority inequality (and vice versa).

### 4.2.2 Method

***Participants.*** Forty participants (22 Male, 18 Female) took part in the survey (Mean age 36.08 years, SD=11.20) in exchange for £1. The survey took participants on average 6 minutes and 46 seconds to complete (SD = 2 minutes, 54 seconds; [3 minutes & 48 seconds, 15 minutes & 44 seconds]). Thirty-six participants self-identified as white European, 2 as Black/ African, 0 as Hispanic, 2 as East Asian, 1 as Indian, 1 as multiracial, 1 as other (participants could enter more than one ethnicity). 39 participants self-identified as UK citizens. In terms of religious affiliation, 5 participants self-identified as Christian, 1 Orthodox, 1 Buddhist, 1 agnostic, 3 as atheist, one participant wrote Yorkshire and 1 participant wrote London, and the remainder either wrote they had no religion or left the question blank. In terms of diet, 18 participants said they were meat-eaters, 13 omnivore, 5 had limited meat intake (ate no red meat or ate only fish or chicken), and 4 were vegetarian. Participants completed the study in their own time, and on an internet enabled device of their choice (e.g., cell phone, tablet, desktop computer).

***Materials.*** Questions were designed to be blatant, explicit, and unambiguous. The questions we included in the pilot needed to meet two criteria. We wanted to capture 1) the notion that X group was superior to Y, and 2) that it was acceptable/appropriate that X benefited at Y's expense. Because we would be using British participants, we made some of the questions explicitly about intergroup relations in the United Kingdom (UK). The scale we aimed to design would be used for various target groups, with the only difference being the names of the target groups changing. Accordingly, we used the following items (replacing 'X' and 'Y' for the corresponding target groups):

1. X dominates Y.
2. X are superior to Y.
3. X are more privileged than Y.
4. It is okay that X benefit from the current order of society.
5. It is okay that Y suffer from the current order of society.
6. In the United Kingdom, how fixed do you think the way X treat Y is?
7. To what extent do you accept the way X treat Y in the UK?
8. Do you agree that the way X treat Y in the UK needs to change?

Participants answered the questions on a sliding scale from 0 (Not at all) to 100 (Completely). The scale went up in whole numbers, so participants could choose any number between (and including) 0 to 100. There were no other words demarcating other points on the scale. When participants were completing the survey, all the sliding scale questions began on 50, so as not to bias the responses one way or another (Bendig, 1953). In addition to the inequalities measures, participants answered demographics.

*Age.* To measure participants age, we asked participants "how old are you?", and participants entered their age in a text box.

*Gender.* To measure participants' gender, we asked participants to select one of three categories that were: male, female, or other.

*Ethnicity.* To measure participants' ethnicity, we asked participants to select one of eight categories that were: white/European, Black/African, Hispanic, East Asian, Indian, Arab, Multiracial, or Other.

*UK citizenship.* To measure participants' citizenship status, we had participants select one of four options that were: UK citizen, UK permanent resident, UK student visa, or not living in the UK.

*Diet.* To measure participants' diet, participants were asked what best describes your diet and were given the following six options: Meat eater, omnivore, limited meat intake (no red meat), limited meat intake (only fish or chicken), vegetarian, or vegan.

***Procedure.*** The participants were recruited from the online survey distributer Prolific Academic (Peer, Brandimarte, Samat, & Acquisti, 2017)**.** Participants completed an online survey that had informed consent, the survey questions, and a short debrief. Participants were reminded that they were not obliged to complete the study, and they could opt out of the study at any time by closing the browser window on their device.

### 4.2.3 Results

***Analysis strategy.*** We used principal components analysis (PCA) to develop single component subscales (manual extraction of one component). We employed both frequentist (using SPSS software) and Bayesian correlations (using JASP software). Unlike null hypothesis significance testing, Bayesian analyses allows for tests in favour of the null hypothesis, and gives a continuous measure of support for the alternative hypothesis. We used the default settings in JASP which had a zero-centred Cauchy prior with scale of .707, which was not updated as we went along with each study. We report Bayes factors alongside significance tests in this and all subsequent chapters. Bayes factors are "a continuous measure of how probable the data are assuming one hypothesis is true (e.g. the alternative hypothesis, H1) relative to another (e.g., the null, H0)" (Loughnan, Davies, Zaharieva, Kinga, & McLatchie, 2019). Bayes factors less than 0.33 are interpreted as moderate evidence for the null, and Bayes factors greater than 3 and 10 are interpreted as moderate and strong evidence for H1 respectively (Dienes, 2014). Bayes factors between 0.33 and 3 provide inconclusive evidence.

***Missing data.*** There was no missing data in pilot study 1.

***Human-animal inequality.*** To measure participants' attitudes towards human-animal inequality we began by asking participants to what extent they agreed with the 8 statements listed in the materials section. After checking for missing data, we looked at the frequentist and Bayesian bivariate correlations between the items. We then ran a PCA as a tool for dimension reduction. See Table 4.1 below for the inter-item Pearson correlations, frequentist *p*-values, and Bayes Factors. In addition, see Table 4.2 and Figure 4.1 for a scree plot and component loadings of the one factor solution.

The results suggested a 5-item component comprising of items 2, 4, 5, 7, and 8, $X_2$ (20, 60) = 68.58, $p < .001$. The 5-item component comprised of the following five items: Humans are superior to animals; It is okay that humans benefit from the current order of society; It is okay that animals suffer from the current order of society; To what extent do you accept the way humans treat animals in the UK; Do you agree that the way humans treat animals in the UK needs to change (r). The component did not include the items about humans dominating animals or being privileged to animals, or the item about how fixed the way humans treat animals is.

Table 4.1. Showing human-animal inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.20 | | | | | | |
| | p | .207 | | | | | | |
| | $BF_{10}$ | 0.43 | | | | | | |
| 3 | r | 0.56 | 0.16 | | | | | |
| | p | < .001 | .322 | | | | | |
| | $BF_{10}$ | 163.60 | 0.32 | | | | | |
| 4 | r | 0.20 | 0.79 | 0.12 | | | | |
| | p | .222 | < .001 | .463 | | | | |
| | $BF_{10}$ | 0.40 | 8.08e +6 | 0.26 | | | | |
| 5 | r | -0.06 | 0.32 | -.12 | 0.38 | | | |
| | p | .731 | .046 | .464 | .014 | | | |
| | $BF_{10}$ | 0.21 | 1.35 | 0.26 | 3.57 | | | |
| 6 | r | -0.04 | -0.07 | 0.01 | -0.15 | -0.23 | | |
| | p | .790 | .676 | .975 | .365 | .157 | | |
| | $BF_{10}$ | 0.20 | 0.21 | 0.20 | 0.29 | 0.52 | | |
| 7 | r | 0.04 | 0.20 | 0.08 | 0.46 | 0.51 | 0.02 | |
| | p | .804 | .208 | .630 | .003 | < .001 | .909 | |
| | $BF_{10}$ | 0.20 | 0.42 | 0.22 | 14.54 | 41.89 | 0.20 | |
| 8 | r | 0.04 | -0.25 | 0.08 | -0.46 | -0.60 | 0.18 | -0.79 |
| | p | .809 | .120 | .635 | .003 | < .001 | .254 | < .001 |
| | $BF_{10}$ | 0.20 | 0.63 | 0.22 | 14.30 | 608.00 | 0.37 | 7.92e +6 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.2. Showing human-animal inequality items and PCA Component Loadings.

| Item | PC 1 | Uniqueness |
|---|---|---|
| 1. Humans dominate animals. | . | 0.974 |
| 2. Humans are superior to animals. | 0.657 | 0.568 |
| 3. Humans are more privileged than animals. | . | 0.989 |
| 4. It is okay that humans benefit from the current order of society. | 0.813 | 0.339 |
| 5. It is okay that animals suffer from the current order of society. | 0.726 | 0.473 |
| 6. In the United Kingdom, how fixed do you think the way humans treat animals is? | . | 0.943 |
| 7. To what extent do you accept the way humans treat animals in the UK? | 0.773 | 0.402 |
| 8. Do you agree that the way humans treat animals in the UK needs to change? | -0.815 | 0.335 |

Note: Small coefficients (<.4) are suppressed.

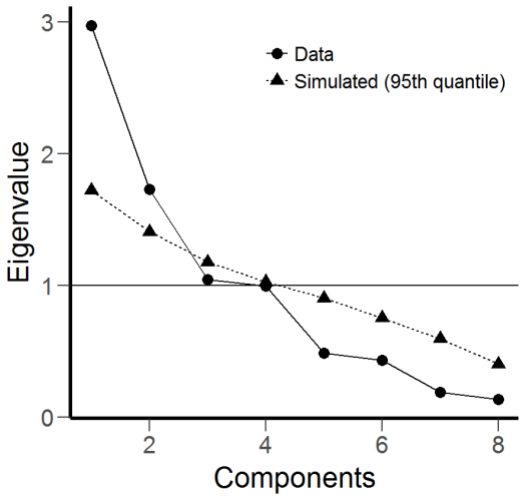


*Figure 4.1.* Scree plot for human-animal inequality PCA results.

***Male-female inequality.*** Next, we looked at the items about the male-female inequality. We used the same 8 items but changed the wording slightly to refer to relations between men and women instead of between humans and animals. See Table 4.3 below for the correlations between items and Table 4.4 and Figure 4.2 below for the PCA results. The results suggested a 6-item component comprising of items 1, 3, 4, 6, 7, and 8, $X_2$ (20, 60) = 89.98, p < .001. The 6-item component comprised of the following six items: Men dominate women; Men are more privileged than women; It is okay that men benefit from the current order of society; In the United Kingdom, how fixed do you think the way men treat women is; To what extent do you accept the way men treat women in the UK (r); Do you agree that the way men treat women in the UK needs to change. The component did not include the items about men being superior to women, or that it was okay that women suffered from the current order of society. The results of the correlations and the PCA for the male subjugation of women differ from the results and correlations of the human subjugation of animals. Most importantly, the key item (2) that "men are superior to women" was not kept in the one-component solution.

Table 4.3. Showing male-female inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.17 | | | | | | |
| | p | .299 | | | | | | |
| | $BF_{10}$ | 0.33 | | | | | | |
| 3 | r | 0.87 | 0.08 | | | | | |
| | p | < .001 | .615 | | | | | |
| | $BF_{10}$ | 2.48e+10 | 0.22 | | | | | |
| 4 | r | -0.16 | 0.31 | -0.22 | | | | |
| | p | .329 | .049 | .168 | | | | |
| | $BF_{10}$ | 0.31 | 1.28 | 0.49 | | | | |
| 5 | r | 0.06 | 0.77 | 0.00 | 0.29 | | | |
| | p | .714 | < .001 | .996 | .067 | | | |
| | $BF_{10}$ | 0.21 | 1.66e+6 | 0.20 | 0.99 | | | |
| 6 | r | -0.36 | -0.06 | -0.36 | 0.22 | -0.11 | | |
| | p | .023 | .711 | .024 | .172 | .508 | | |
| | $BF_{10}$ | 2.35 | 0.21 | 2.30 | 0.49 | 0.24 | | |
| 7 | r | -0.47 | 0.06 | -0.50 | 0.49 | 0.29 | 0.31 | |
| | p | .002 | .705 | .001 | .001 | 0.074 | .051 | |
| | $BF_{10}$ | 19.76 | 0.21 | 32.43 | 28.17 | 0.92 | 1.24 | |
| 8 | r | 0.75 | -0.02 | 0.83 | -0.23 | -0.15 | -0.32 | -0.752 |
| | p | < .001 | .926 | < .001 | .148 | .372 | .047 | < .001 |
| | $BF_{10}$ | 5.56e +5 | 0.20 | 4.13e+8 | 0.54 | 0.29 | 1.33 | 6.71e +5 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.4. Showing male-female inequality items and PCA Component Loadings

| Item | PC 1 | Uniqueness |
|---|---|---|
| 1. Men dominate women | 0.84 | 0.29 |
| 2. Men are superior to women | . | 1.00 |
| 3. Men are more privileged than women | 0.88 | 0.22 |
| 4. It is okay that men benefit from the current order of society. | -0.45 | 0.80 |
| 5. It is okay that women suffer from the current order of society. | . | 0.97 |
| 6. In the United Kingdom, how fixed do you think the way men treat women is? | -0.50 | 0.75 |
| 7. To what extent do you accept the way men treat women in the UK? | -0.80 | 0.37 |
| 8. Do you agree that the way men treat women in the UK needs to change? | 0.92 | 0.16 |

Note: Small coefficients (<.4) are suppressed.

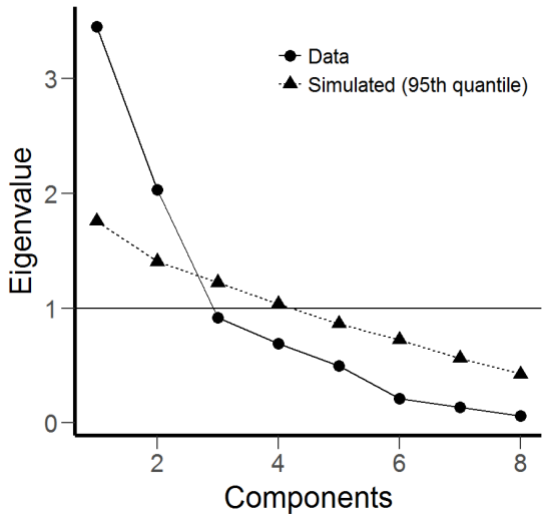


*Figure 4.2.* Scree plot for male-female inequality PCA results.

***White European-ethnic minority inequality***

Next, we looked at the items about the white European-ethnic minority inequality. We used the same 8 items but changed the wording to refer to relations between white Europeans and ethnic minorities. See Table 4.5 below for the correlations between items and Table 4.6 and Figure 4.3 below for the PCA results. The results suggested a 7-item component, $X_2$ (20, 60) = 53.63,

*p* < .001. The only item that the PCA did not keep was item 6: In the United Kingdom, how fixed do you think the way white Europeans treat ethnic minorities is? While the ethnic minorities component did include the key item about white Europeans supremacy, the component was again (like the male subjugation of women), different to the humans and animals component. The difference was again the inclusion of the questions about domination and privilege.

Table 4.5. Showing the European-ethnic minority inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | -0.01 | | | | | | |
| | p | .970 | | | | | | |
| | $BF_{10}$ | 0.20 | | | | | | |
| 3 | r | 0.50 | -0.30 | | | | | |
| | p | < .001 | .058 | | | | | |
| | $BF_{10}$ | 40.21 | 1.12 | | | | | |
| 4 | r | -0.23 | 0.40 | -0.41 | | | | |
| | p | .157 | .011 | .008 | | | | |
| | $BF_{10}$ | 0.52 | 4.48 | 5.71 | | | | |
| 5 | r | -0.27 | 0.77 | -0.58 | 0.45 | | | |
| | p | .097 | < .001 | < .001 | .003 | | | |
| | $BF_{10}$ | 0.74 | 2.49e+6 | 309.36 | 12.24 | | | |
| 6 | r | -0.04 | 0.08 | -0.20 | 0.08 | 0.20 | | |
| | p | .786 | .635 | .209 | .635 | .218 | | |
| | $BF_{10}$ | 0.20 | 0.22 | 0.42 | 0.22 | 0.41 | | |
| 7 | r | 0.01 | 0.28 | -0.31 | 0.60 | 0.28 | 0.07 | |
| | p | .940 | .085 | .050 | < .001 | .082 | .677 | |
| | $BF_{10}$ | 0.20 | 0.83 | 1.25 | 569.49 | 0.85 | 0.21 | |
| 8 | r | 0.38 | -0.48 | 0.54 | -0.51 | -0.64 | -0.27 | -0.60 |
| | p | .016 | .002 | < .001 | < .001 | < .001 | .097 | < .001 |
| | $BF_{10}$ | 3.20 | 24.31 | 89.57 | 44.80 | 2874.24 | 0.74 | 679.90 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.6. Showing the European-ethnic minority inequality items and PCA Component Loading.

| Item | PC 1 | Uniqueness |
|---|---|---|
| 1. White Europeans dominate ethnic minorities. | -0.42 | 0.82 |
| 2. White Europeans are superior to ethnic minorities. | 0.68 | 0.54 |
| 3. White Europeans are more privileged than ethnic minorities. | -0.73 | 0.46 |
| 4. It is okay that White Europeans benefit from the current order of society. | 0.72 | 0.48 |
| 5. It is okay that ethnic minorities suffer from the current order of society. | 0.83 | 0.30 |
| 6. In the United Kingdom, how fixed do you think the way White Europeans treat ethnic minorities is? | . | 0.92 |
| 7. To what extent do you accept the way White Europeans treat ethnic minorities in the UK? | 0.62 | 0.61 |
| 8. Do you agree that the way White Europeans treat ethnic minorities in the UK needs to change? | -0.86 | 0.26 |

Note: Small coefficients (<.4) are supressed.

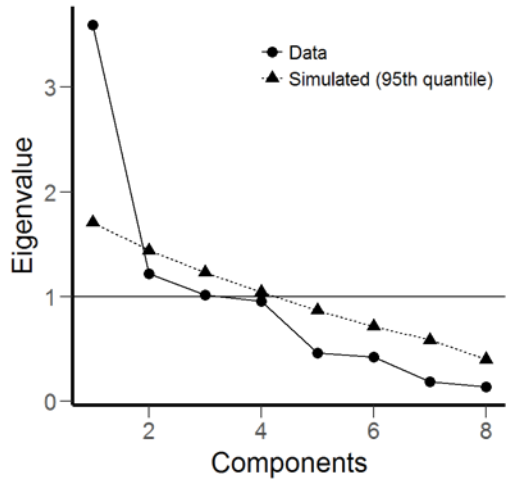


*Figure 4.3.* Scree plot for the European-ethnic minority inequality PCA results.

### 4.2.4 Discussion

The first goal of pilot study 1 was to see whether the endorsement of gender or racial inequalities were similar to human-animal inequality. To do this we developed a scale that would capture individual differences in the

extent to which people endorse each of those inequalities. We used the dimension reduction method of principal components analysis (PCA) to find the single component which best-captured participants' endorsement of three inequalities. However, the results of the three PCAs were all different and our first hypothesis was not supported. Consequently, we could not test our second hypothesis. The scale items which best captured the common variance between the items regarding human-animal inequality were different to the items which best captured the common variance between the items pertaining to gender or race relations.

It may be that because people do not themselves dominate animals, or see animals as unprivileged (because animals are so far beyond the realm of moral concern) domination and privilege do not best capture the variation in the endorsement of human-animal inequality. That is, the results revealed that, at least in the current study, the content of the way people think about human-animal inequality may be different to the way they think about the male-female inequality, and the white European-ethnic minority inequality in the United Kingdom. It is also possible that because our sample size for pilot study 1 was small we were unable to find support for our hypotheses. An alternative interpretation to a null result due to small sample size is that the main differences between the components for human-animal inequality and the male-female inequality were the inclusion of the items about domination and privilege for the male-female inequality, and the inclusion of ideas about superiority and the acceptance of harming animals for human-animal inequality. Human-animal inequality and the male-female inequality were in turn both different to the white Europeans-ethnic minority inequality. Unlike the male-female inequality, participants' endorsement of the white Europeans-ethnic minority inequality included ideas about superiority and the acceptance of harming minorities for the majority's benefit; dissimilar to human-animal inequality, participants' endorsement of white Europeans-ethnic minority inequality included items about majority whites being privileged and dominating ethnic minorities.

To the best of our knowledge, this is the first study that has compared various forms of human inequality to see the similarities and differences between human-animal and human inequalities. This short pilot study adds to the existing body of work on human animal relations, by giving initial evidence that there might be subtle but important differences in the way people think about human-animal and human inequalities. While prejudice research has shown there are correlations between prejudice towards animals and prejudice towards human groups, the current research shows that the way people think about human-animal and particular human (e.g., male-female and white Europeans-Ethnic minority) inequalities are different. This finding could be explained in terms of the more subtle nature of prejudice towards women (benevolent sexism) and ethnic minorities (aversive racism). This would be an interesting avenue for future research.

To examine the relationship between human and human-animal inequality, we turned our attention to other oppressed groups towards whom we thought people would more openly endorse their prejudice. In our next study (pilot study 2), we wanted to find human inequalities which produced the same principal component as human-animal inequality. As in our initial plans for pilot study 1, the scale we hoped to develop in pilot study 2 would then be used as the DVs in the subsequent experiments (e.g., chapter 4).

## 4.3 Pilot Study 2

### 4.3.1 Introduction

Pilot Study 1 revealed that the way people think about human-animal inequality was different to the way they thought about the male-female or the white European-ethnic minority inequalities. The purpose of pilot study 2 was to identify other human inequalities that would show more alignment with human-animal inequality. In doing so, we would identify the human target group to be used as the comparison condition in the subsequent experimental studies (chapters 4 - 7).

As we have shown by introducing the meat paradox (chapter 1), people tend not to have strong and inflexible justifications for human-animal inequality: psychologically navigating human-animal inequality is flexible and can change

as a function of the situation. Because people in pilot study 1 did not think of animals being dominated and humans being privileged (but did for the male-female and white European inequalities), we wanted to select human inequalities, which, like human-animal inequality, are on the fringes of moral concern. We therefore chose to use human inequalities based on previous research highlighting those individuals in society that are the most dehumanized (Harris & Fiske, 2006). Human inequality we included in this study were between non-addicts and drug addicts; homeowners and homeless people; and the mentally healthy and the mentally ill. Due to the unexpected results of pilot study 1, we did not have hypotheses about which human inequality would map onto human-animal inequality. We did, however, hypothesize that:

a) All subscales will be positively correlated.
b) Support for human-animal inequality would be a stronger predictor of human inequalities (e.g., drug addict inequality) than any other human inequality (e.g., homeless inequality), and vice versa.

### 4.3.2 Method

***Participants.*** The participants were 63 individuals recruited from the online site prolific academic (Mean age = 35.32, SD =12.01; 35 female, 28 male), who completed the study in exchange for £1. The study took participants 8 minutes, 16 seconds to complete (*SD* = 3 minutes, 40 seconds). Regarding ethnicity, 60 participants self-identified as white European, 2 Indian, 1 ‘other’. In terms of citizenship, 59 participants were UK citizens, 3 were permanent residents. With respect to diet, 30 participants self-identified as meat-eaters, 16 as omnivore, 7 were vegetarian, 7 had limited meat intake (no red meat, or only fish or chicken), and 3 were vegan (no animal products). No participants were excluded from data analysis.

***Design.*** The study was a correlational within-subjects design. Participants completed demographics, and a survey about different groups in society.

***Materials.*** For each inequality, we presented participants with eight questions measuring the extent to which they endorsed that inequality. The

questions were the same structure as in the previous pilot study (replacing ‘X’ and ‘Y’ for the corresponding inequality). Participants answered the questions on the same sliding scale as pilot study 2 from 0 (Not at all) to 100 (Completely). The items were:

1. X dominate Y.
2. X are superior to Y.
3. X are more privileged than Y.
4. It is okay that X benefit from the current order of society.
5. It is okay that Y suffer from the current order of society.
6. In the United Kingdom, how fixed do you think the way X treat Y is?
7. To what extent do you accept the way X treat Y in the UK?
8. Do you agree that the way X treat Y in the UK needs to change?

In addition to the above primary questions, participants were also given demographics and existing measures of social dominance orientation (SDO) and system justification to examine the new scale’s convergent validity with existing validated measures of related but different constructs.

*Age.* To measure participants age, we asked participants “how old are you?”, and participants entered their age in a text box (e.g., 21).

*Gender.* To measure participants’ gender, we asked participants to select one of three categories that were: male, female, or other.

*Ethnicity.* To measure participants’ ethnicity, we asked participants to select one of eight categories that were: White/European, Black/African, Hispanic, East Asian, Indian, Arab, Multiracial, or Other.

*UK citizenship.* To measure participants’ citizenship status, we had participants select one of three options that were: UK citizen, UK permanent resident, or UK student visa.

*Diet.* To measure participants’ diet, participants were asked what best describes your diet and were given the following six options: Meat eater, omnivore, limited meat intake (no red meat), limited meat intake (only fish or chicken), vegetarian, or vegan.

*Social Dominance Orientation (SDO).* Participants support for group-based inequality, or social dominance orientation, was measured with an

existing, validated 4-item measure of Social Dominance Orientation taken directly from (Wilson & Liu, 2003). Participants were asked “for each of the following questions about groups in general, indicate whether you think the statement is positive or negative:” Winning is more important than how the game is played; Getting ahead by any means necessary; Sometimes war is necessary to put other countries in their place; Inferior groups should stay in their place. The scale was anchored from 1 (Very Negative), through 3 (Neutral), to 5 (Very Positive), and had good internal reliability, α = .81, 95% CI [0.72, 0.88].

*System Justification.* To measure participant’s belief that society is fair and just, we used a validated 8-item measure of system justification (Kay & Jost, 2003). Participants answered to what extent they agree with various statements about society. Example questions include “In general, I find society to be fair; In general, the British political system operates as it should; British society needs to be radically restructured (reverse scored)”. The scale was anchored from 1 (Strongly Disagree), through 4 (Neither Agree nor Disagree), to 7 (Strongly Agree). The scale had good internal reliability, α = .85, 95% CI [0.79, 0.90].

***Procedure.*** The participants were recruited from the online survey distributer Prolific Academic (Peer, Brandimarte, Samat, & Acquisti, 2017)**.** Participants completed an online survey that had informed consent, the survey questions, and a short debrief. Participants were reminded that they were not obliged to complete the study, and they could opt out of the study at any time by closing the browser window on their device.

### 4.3.3 Results

***Analysis strategy.*** We initially examined the correlations between the items for each target group, and then ran a principal components analysis (PCA) to reduce each measure to one dimension. The purpose of the principal component analysis was two-fold. We first wanted to see whether participants’ thoughts about the different inequalities would compose the same component. The goal was to identify human inequality that mapped onto human-animal inequality (i.e., a PCA produced a similar scale for the human and human-

animal inequality). The purpose of the data reduction method was to identify the items in each subscale capturing most of the variance, and reflecting the underlying construct. Therefore, because we aimed to reduce each scale down, we chose to use principal components analysis. Because we only required one scale per target, we used manual extraction to produce a single dimension for each target.

We did not run all the items together in one principal component analysis as each subscale used the same items with different target groups. Because of this, the PCA algorithm would be comparing the fit between each single inequality (i.e., all the questions about humans and animals), and between the similar questions (e.g., X is superior to Y; A is superior to B). In addition, we wanted individual measures for each target group precisely so we could compare the foundational hypothesis in the subsequent experiments (see chapter 4). For a discussion of doing PCA the way utilized in this thesis, please see the discussion of this chapter.

***Missing data.*** Of the 63 participants, 16 had missing data. There was no systematic missing data (e.g., one person having most of the missing data, or one item having most of the missing data). Because the measures with a sliding scale (from 0 to 100) started on 50, we reasoned that participants might have left the marker where it was if they wanted to leave it on 50. However, if the marker was not touched, Qualitrics recorded that item as missing data. Accordingly, we transformed all missing data to 50 (i.e., the scale midpoint and default position).

***Human-animal inequality.*** Table 4.7 below shows the inter-item Pearson correlations (two-tailed), frequentist p-values, and Bayes Factors between human-animal inequality items. After looking at the frequentist and Bayesian correlations, we ran a PCA with manual extraction yielding one component. See Figure 3.4 below for a scree plot and Table 4.8 for the component loadings of the one factor solution. We wanted to reduce the measure down to one scale, (to highlight those items which should be discarded), and so we used manual extraction of one component.

Table 4.7. Showing human-animal inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.17 | | | | | | |
| | p | .190 | | | | | | |
| | $BF_{10}$ | 0.36 | | | | | | |
| 3 | r | 0.43 | 0.29 | | | | | |
| | p | < .001 | 0.022 | | | | | |
| | $BF_{10}$ | 68.96 | 2.04 | | | | | |
| 4 | r | 0.28 | 0.68 | 0.23 | | | | |
| | p | .026 | < .001 | .066 | | | | |
| | $BF_{10}$ | 1.79 | 1.32e +7 | 0.82 | | | | |
| 5 | r | 0.02 | 0.46 | 0.01 | 0.41 | | | |
| | p | .869 | < .001 | .935 | < .001 | | | |
| | $BF_{10}$ | 0.16 | 203.19 | 0.16 | 37.24 | | | |
| 6 | r | -0.15 | -0.18 | 0.03 | -0.03 | -0.17 | | |
| | p | .230 | .165 | .791 | .802 | .192 | | |
| | $BF_{10}$ | 0.32 | 0.40 | 0.16 | 0.16 | 0.36 | | |
| 7 | r | -0.00 | 0.44 | -0.07 | 0.56 | 0.43 | -0.27 | |
| | p | .974 | < .001 | .612 | < .001 | < .001 | .034 | |
| | $BF_{10}$ | 0.16 | 93.22 | 0.18 | 1.26e +4 | 70.57 | 1.41 | |
| 8 | r | -0.12 | -0.38 | 0.14 | -0.56 | -0.51 | 0.37 | -0.75 |
| | p | .354 | .002 | .260 | < .001 | < .001 | .003 | < .001 |
| | $BF_{10}$ | 0.24 | 15.68 | 0.29 | 1.28e +4 | 1067.49 | 12.16 | 9.52e +9 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.8. Showing human-animal inequality, items and component loadings.

| Item | RC 1 | Uniqueness |
|---|---|---|
| Humans dominate animals. | . | 0.93 |
| Humans are superior to animals. | 0.75 | 0.43 |
| Humans are more privileged than animals. | . | 0.98 |
| It is okay that humans benefit from the current order of society. | 0.82 | 0.33 |
| It is okay that animals suffer from the current order of society. | 0.68 | 0.54 |
| In the United Kingdom, how fixed do you think the way humans treat animals is? | . | 0.86 |
| To what extent do you accept the way humans treat animals in the UK? | 0.80 | 0.36 |

Table 4.8. Showing human-animal inequality, items and component loadings.

| Item | RC 1 | Uniqueness |
|---|---|---|
| Do you agree that the way humans treat animals in the UK needs to change? | 0.82 | 0.32 |

Note: Small coefficients (<.4) are supressed.

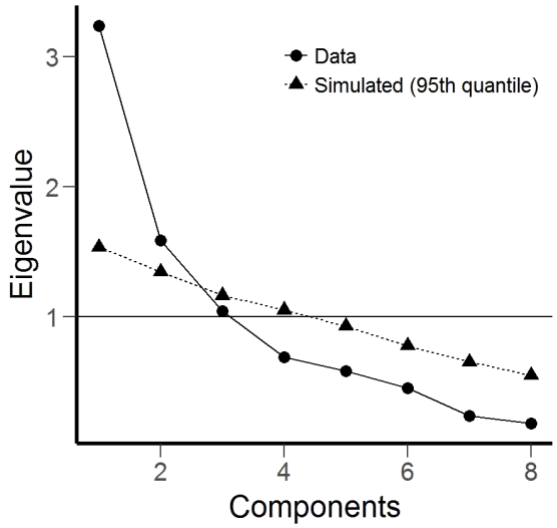


Figure 4.4. Showing Scree Plot for human-animal inequality PCA.

The results suggested a 5-item factor comprising of items 2, 4, 5, 7, and 8, $X_2$ (20, 60) = 74.63, p < .001. As a final step we refined the solution down to 4-items because two items were measuring almost the same thing, as can be seen in the face value of items 7 (To what extent do you accept the way humans treat animals in the UK) and 8 (Do you agree that the way humans treat animals in the UK needs to change), and in the correlations. The final human-animal inequality measure comprised of the following four items (*M* = 48.11, *SD* =18.60): Humans are superior to animals; it is okay that humans benefit from the current order of society; it is okay that animals suffer from the current order of society. To what extent do you accept the way humans treat animals in the UK. The scale had good internal reliability, α = .80, 95% CI [0.70, 0.87].

***Drug addict inequality.*** Table 4.9 below shows the inter-item Pearson correlations (two-tailed), frequentist p-values, and Bayes factors between drug addict inequality items.

Table 4.9. Showing drug addict inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.04 | | | | | | |
| | p | .738 | | | | | | |
| | $BF_{10}$ | 0.17 | | | | | | |
| 3 | r | 0.34 | 0.20 | | | | | |
| | p | .006 | .107 | | | | | |
| | $BF_{10}$ | 6.59 | 0.56 | | | | | |
| 4 | r | 0.02 | 0.68 | 0.19 | | | | |
| | p | .852 | < .001 | .136 | | | | |
| | $BF_{10}$ | 0.16 | 1.56e +7 | 0.47 | | | | |
| 5 | r | 0.09 | 0.61 | 0.02 | 0.50 | | | |
| | p | .466 | < .001 | .886 | < .001 | | | |
| | $BF_{10}$ | 0.20 | 1.96e +4 | 0.16 | 710.26 | | | |
| 6 | r | 0.08 | 0.13 | 0.19 | 0.22 | 0.18 | | |
| | p | .527 | 0.293 | .144 | 0.089 | .152 | | |
| | $BF_{10}$ | 0.19 | 0.27 | 0.45 | 0.65 | 0.43 | | |
| 7 | r | -0.05 | 0.68 | 0.12 | 0.58 | 0.63 | 0.33 | |
| | p | .669 | < .001 | .348 | < .001 | < .001 | .007 | |
| | $BF_{10}$ | 0.17 | 1.73e +7 | 0.24 | 3.33e +4 | 5.16e +5 | 5.23 | |
| 8 | r | 0.08 | -0.74 | -0.12 | -0.53 | -0.66 | -0.29 | -0.78 |
| | p | .526 | < .001 | .332 | < .001 | < .001 | .022 | < .001 |
| | $BF_{10}$ | 0.19 | 1.77e +9 | 0.25 | 3129.42 | 4.33e +6 | 2.06 | 1.52e +11 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

After looking at the frequentist and Bayesian correlations, we ran a manual PCA yielding one component. See Figure 3.5 below for a scree plot and component loadings of the one factor solution. We wanted to reduce the measure down to one scale, (to highlight those items which should be discarded), and so we again used manual extraction of one component.

Table 4.10. Showing drug addict inequality items and component loadings.

| Item | RC 1 | Uniqueness |
|---|---|---|
| Those who are not addicted to drugs dominate drug addicts | . | 1.00 |
| Those who are not drug addicts are superior to those who are. | 0.87 | 0.24 |

Table 4.10. Showing drug addict inequality items and component loadings.

| Item | RC 1 | Uniqueness |
|---|---|---|
| Those who are not drug addicts are more privileged than those who are. | . | 0.94 |
| It is okay that those who are not drug addicts benefit from the current order of society. | 0.77 | 0.41 |
| It is okay that drug addicts suffer from the current order of society. | 0.79 | 0.38 |
| In the United Kingdom, how fixed do you think the way non addicted persons treat drug addicts is? | . | 0.86 |
| To what extent do you accept the way non addicted persons treat drug addicts in the UK? | 0.88 | 0.23 |
| Do you agree that the way non addicted persons treat drug addicts in the UK needs to change? | 0.88 | 0.22 |

Note: Small coefficients (<.4) are supressed.

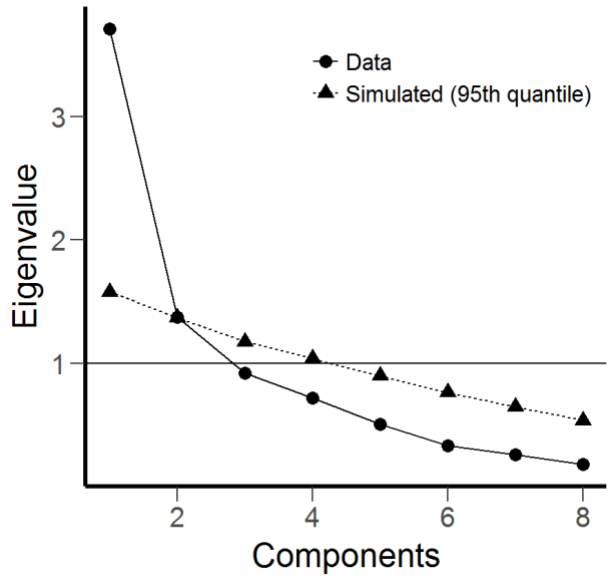


*Figure 4.5.* Scree plot for non-addict-drug addict inequality, visually showing results of the PCA.

The results suggested the same 5-item factor comprising of items 2, 4, 5, 7, and 8, $X_2$ (20, 60) = 36.06, p = .02. As a final step we refined the solution down to 4 items because the same two items (7 and 8) were measuring almost the same thing, as can be seen in the face value of the items 7 (To what extent do you accept the way non-addicted persons treat drug addicts in the UK) and 8 (Do you agree that the way non-addicted persons treat drug addicts in the UK needs to change), and in the correlations. The final drug addict inequality

measure comprised of the following four items (*M* = 46.47, *SD* = 12.60): Non-addicts are superior to drug addicts; It is okay that non-addicts benefit from the current order of society; It is okay that drug addicts suffer from the current order of society. To what extent do you accept the way non-addicts treat drug addicts in the UK? The scale also had good internal reliability, α = .86, 95% CI [0.80, 0.91].

**Homeowner-homeless inequality.** Table 4.11 below shows the inter-item Pearson correlations (two-tailed), frequentist p-values, and Bayes Factors between the homeowner-homeless inequality items. After looking at the frequentist and Bayesian correlations, we ran a manual PCA asking for one component. See Figure 3.6 below for a scree plot and component loadings of the one factor solution. Similar to previous PCA's, we wanted to reduce the measure down to one scale, (to highlight those items which should be discarded), and so we used manual extraction of one component.

Table 4.11. Showing homeowner-homeless inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.14 | | | | | | |
| | p | .287 | | | | | | |
| | $BF_{10}$ | 0.27 | | | | | | |
| 3 | r | 0.20 | -0.10 | | | | | |
| | p | .112 | .423 | | | | | |
| | $BF_{10}$ | 0.54 | 0.22 | | | | | |
| 4 | r | 0.15 | 0.38 | 0.10 | | | | |
| | p | .236 | .002 | .444 | | | | |
| | $BF_{10}$ | 0.31 | 15.13 | 0.21 | | | | |
| 5 | r | 0.16 | 0.64 | -0.27 | 0.26 | | | |
| | p | .220 | < .001 | .034 | .036 | | | |
| | $BF_{10}$ | 0.33 | 1.17e +6 | 1.40 | 1.35 | | | |
| 6 | r | 0.12 | 0.01 | -0.03 | 0.24 | 0.04 | | |
| | p | .357 | .951 | .793 | .061 | .735 | | |
| | $BF_{10}$ | 0.24 | 0.16 | 0.16 | 0.87 | 0.17 | | |
| 7 | r | 0.07 | 0.61 | -0.12 | 0.33 | 0.39 | 0.18 | |
| | p | .597 | < .001 | .359 | .009 | .001 | .148 | |

Table 4.11. Showing homeowner-homeless inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| | $BF_{10}$ | 0.18 | 1.76e +5 | 0.24 | 4.50 | 23.17 | 0.44 | |
| 8 | r | -0.01 | -0.41 | 0.23 | -0.34 | -0.55 | -0.15 | -0.64 |
| | p | .943 | < .001 | .074 | .007 | < .001 | .237 | < .001 |
| | $BF_{10}$ | 0.16 | 33.00 | 0.75 | 5.67 | 5847.99 | 0.31 | 8.05e +5 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.11. Showing homeowner-homeless inequality items and component loadings.

| Item | RC 1 | Uniqueness |
|---|---|---|
| Those who live in homes dominate the homeless. | . | 0.97 |
| Those who live in homes are superior to the homeless. | 0.80 | 0.36 |
| Those who live in homes are more privileged than the homeless. | . | 0.94 |
| It is okay that those who live in homes benefit from the current order of society. | 0.56 | 0.69 |
| It is okay that the homeless suffer from the current order of society. | 0.77 | 0.40 |
| In the United Kingdom, how fixed do you think the way those who live in homes treat the homeless is? | . | 0.94 |
| To what extent do you accept the way those who live in homes treat the homeless in the UK? | 0.80 | 0.36 |
| Do you agree that the way those who live in homes treat the homeless in the UK needs to change | 0.79 | 0.38 |

Note: Small coefficients (<.4) are supressed.

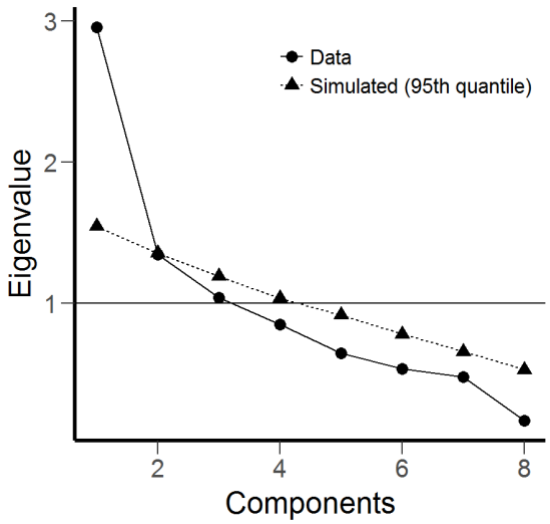


*Figure 4.6.* Scree plot for subjugation of homeless, visually showing results of the PCA.

The results again suggested the same 5-item factor comprising of items 2, 4, 5, 7, and 8, $X_2$ (20, 60) = 48.79, p < .001. As a final step, we again refined the solution down to 4 items because the same two items (7 and 8) were also measuring the same thing, as can be seen in the face value of the items 7 and

8, and in the correlations. The final homeowner-homeless inequality measure comprised of the following four items (M=33.65, SD =16.04): Homeowners are superior to the homeless; it is okay that homeowners benefit from the current order of society; it is okay that the homeless suffer from the current order of society. To what extent do you accept the way homeowners treat the homeless in the UK? The scale had good internal reliability, α = .75, 95% CI [0.64, 0.84].

***Mentally healthy-mentally ill inequality.*** Table 4.12 below shows mentally healthy-mentally ill inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors. After looking at the frequentist and Bayesian correlations, we ran a PCA with manual extraction yielding one component. See Figure 4.7 below for a scree plot and component loadings of the one factor solution. The results of the PCA also suggested the 5-item factor comprising of items 2, 4, 5, 7, and 8, X2 (20, 60) = 46.82, p < .001. As a final step, we again refined the solution down to 4 items because the same two items (7 and 8) which were measuring the same thing, as can be seen in the face value of the items 7 and 8, and in the correlations. The final mentally healthy-mentally ill inequality measure comprised of the following four items (M =30.87, SD =13.39): Mentally healthy people are superior to the mentally ill; It is okay that mentally healthy people benefit from the current order of society; It is okay that the mentally ill suffer from the current order of society. To what extent do you accept the way mentally healthy people treat the mentally ill in the UK? The scale had good internal reliability, α = .73, 95% CI [0.60, 0.82].

Table 4.12. Showing the mentally healthy-mentally ill inequality inter-item Pearson correlations, frequentist p-values, and Bayes factors.

| Item | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.20 | | | | | | |
| | p | .110 | | | | | | |
| | $BF_{10}$ | 0.55 | | | | | | |
| 3 | r | 0.26 | -0.04 | | | | | |
| | p | .041 | .755 | | | | | |
| | $BF_{10}$ | 1.21 | 0.16 | | | | | |
| 4 | r | -0.07 | 0.42 | -0.18 | | | | |
| | p | .598 | < .001 | .150 | | | | |
| | $BF_{10}$ | 0.18 | 56.28 | 0.43 | | | | |
| 5 | r | -0.04 | 0.49 | -0.13 | 0.17 | | | |
| | p | .766 | < .001 | .300 | .178 | | | |
| | $BF_{10}$ | 0.16 | 618.62 | 0.27 | 0.38 | | | |
| 6 | r | -0.28 | -0.04 | 0.05 | 0.20 | -0.02 | | |
| | p | .024 | .734 | .726 | .112 | .850 | | |
| | $BF_{10}$ | 1.89 | 0.17 | 0.17 | 0.54 | 0.16 | | |
| 7 | r | -0.12 | 0.46 | -0.29 | 0.53 | 0.34 | 0.11 | |
| | p | .346 | < .001 | .022 | < .001 | .007 | .383 | |
| | $BF_{10}$ | 0.24 | 197.64 | 2.05 | 2223.48 | 5.62 | 0.23 | |
| 8 | r | 0.09 | -0.53 | 0.07 | -0.26 | -0.33 | -0.20 | -0.57 |
| | p | .484 | < .001 | .576 | .040 | .008 | .123 | < .001 |
| | $BF_{10}$ | 0.20 | 3026.31 | 0.18 | 1.23 | 4.84 | 0.50 | 1.36e +4 |

Note. Correlations are two-tailed; r = Pearson's r; p = p-value; $BF_{10}$ = Bayes factor; Items 1-8 correspond with new materials developed.

Table 4.13. Mentally healthy-mentally ill inequality items and component loadings.

| | RC 1 | Uniqueness |
|---|---|---|
| Mentally healthy people dominate the mentally ill. | . | 0.98 |
| Mentally healthy people are superior to the mentally ill. | 0.76 | 0.42 |
| Mentally healthy people are more privileged than the mentally ill. | . | 0.90 |
| It is okay that mentally healthy people benefit from the current order of society. | 0.66 | 0.57 |
| It is okay that the mentally ill suffer from the current order of society. | 0.60 | 0.64 |
| In the United Kingdom, how fixed do you think the way mentally healthy people treat the mentally ill is? | . | 0.96 |
| To what extent do you accept the way mentally healthy people treat the mentally ill? | 0.82 | 0.32 |
| Do you agree that the way mentally healthy people treat the mentally ill in the UK needs to change? | 0.75 | 0.44 |

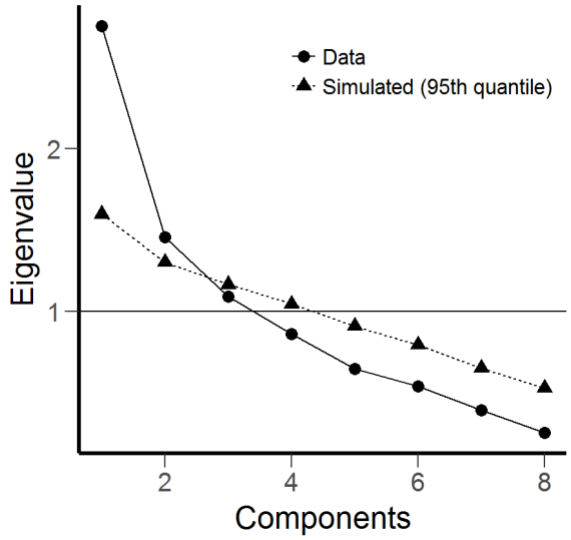


Figure 4.7. Scree plot for mentally healthy-mentally ill inequality, visually showing results of the PCA.

***Convergent validity.*** While the PCA results were promising, we also wanted to see whether the scales had good convergent validity by also measuring attitudes towards SDO and system justification, both more general

measures of group based dominance (SDO) and justification of the status quo (system justification), both related but insufficient measures of inequalities. Predictive validity of the subscales is tested in our final study with charitable behaviour, in chapter 4.

Table 4.14. Showing inter-correlations, frequentist p-values, and Bayes factors between all target measures, social dominance orientation (SDO), and system justification (SJ).

| Measure | | Animals | Addicts | Mentally Ill | Homeless | SDO |
|---|---|---|---|---|---|---|
| Addicts | r | 0.45 | | | | |
| | p | < .001 | | | | |
| | $BF_{10}$ | 264.52 | | | | |
| Mentally Ill | r | 0.49 | 0.58 | | | |
| | p | < .001 | < .001 | | | |
| | $BF_{10}$ | 994.81 | 5.64e+4 | | | |
| Homeless | r | 0.67 | 0.69 | 0.78 | | |
| | p | < .001 | < .001 | < .001 | | |
| | $BF_{10}$ | 1.16e+7 | 5.36e+7 | 4.32e+11 | | |
| SDO | r | 0.28 | 0.51 | 0.45 | 0.59 | |
| | p | .014 | < .001 | < .001 | < .001 | |
| | $BF_{10}$ | 3.22 | 2114.07 | 281.14 | 7.32e+4 | |
| SJ | r | 0.30 | 0.29 | 0.38 | 0.54 | 0.34 |
| | p | .010 | .010 | < .001 | < .001 | .003 |
| | $BF_{10}$ | 4.58 | 4.22 | 35.36 | 7691.89 | 11.60 |

Note: All tests are one-tailed.

Table 4.15. Means and standard deviations of measures developed in pilot study 2, SDO, and system justification.

| Measure | Mean | SD | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|
| | | | Statistic | SE | Statistic | SE |
| Animal | 48.11 | 22.74 | -.10 | 0.30 | .05 | 0.60 |
| Addicts | 46.47 | 23.54 | -.08 | 0.30 | -.77 | 0.60 |
| Mentally ill | 30.87 | 18.39 | 0.31 | 0.30 | -.37 | 0.60 |
| Homeless | 33.65 | 18.77 | 0.50 | 0.30 | -.26 | 0.60 |
| SDO | 1.98 | 0.80 | 1.30 | 0.30 | 2.43 | 0.60 |
| SJ | 3.46 | 1.13 | 0.18 | 0.30 | -0.55 | 0.60 |

Note: SD = standard deviation, SE = standard error, SDO = social dominance orientation, SJ = system justification.

### 4.3.4 Discussion

The purpose of pilot study 2 was to identify human inequalities with a stronger affinity with participants' endorsement of human-animal inequality than pilot study 1 found. In addition, we wanted to identify human inequality to be used as the comparison condition in the subsequent experimental studies (see chapter 4). Accordingly, we turned our attention to inequalities that we thought people would more openly endorse (Harris & Fiske, 2006). We therefore chose to use the drug addict, homeless, and mentally ill inequalities. Previous research has shown these groups to be dehumanized the most by western society (Harris & Fiske, 2006).

We found good evidence from our correlations and PCA results that all human inequalities in pilot study 2 share an affinity with how participants thought of human-animal inequality. All of human inequality produced the same single PCA dimension. The items that we kept for each final scale were the same for both human-animal and human inequalities. The scale items had strong face validity, measuring the endorsement that it was okay that the 'superior' group benefited and the 'inferior' group suffered from the current order of society; acceptance of the relationship between the groups; and belief that one group was superior to the other. The questions that were not kept in the study were questions about the oppressor dominating the other; the oppressor being privileged, the relationship between the two groups being fixed, and one item about the status quo needing to change (which was too similar to the item about accepting the status quo). We decided to keep the question about 'accepting the status quo', over 'wanting the status quo to change' as it had stronger face validity with the other 3 items in the scale. On reflection, the item about the way X treating Y being fixed was not as clear as the others, and routinely had low correlations with other items, as confirmed in the results of the PCA's. We were intending the question to measure how changeable participants thought the inequality is. However, in hindsight, the endorsement of a inequality is orthogonal to whether one thinks that system is fixed or rigid.

Nevertheless, having the PCA for each inequality produce the same items adds to the psychology of human-animal relations by introducing a short

scale measuring the endorsement of both human and human-animal inequalities (see also general discussion of this chapter). Each of the sub-scales correlated with SDO and System justification in a moderate and significant way, however, there were important differences between the measures as evident in the moderate correlations. Bayes factors also provided evidence that our subscales were positively correlated with SDO and System Justification. Our subscales although correlated, are measuring variance that SDO and system justification do not capture, as shown in the correlations between all items in Table 4.14. In short, pilot study 2 produced four 4-item measures with strong face validity, capturing individual differences in the extent to which participants endorse human-animal and human inequalities. Each scale also had good convergent validity, correlating positively, but moderately, with validated measures of social dominance orientation (Pratto, Sidanius, Stallworth, & Malle, 1994) and system justification (Kay & Jost, 2003).

After having created the subscales, we then tested our correlational hypotheses (see Table 4.14). We first hypothesized that endorsement of all inequalities would be positively correlated with each other, and found good evidence of this ($0.45 < \text{all } rs < 0.78$). We next hypothesised that human-animal inequality would correlate higher with human inequalities if human-animal inequality is foundational to human inequalities. However, when looking at the correlations (see Table 4.14), it is clear that even though endorsing human-animal inequality correlates well with endorsing human inequality ($0.45 < \text{all } rs < 0.67$), the correlations between the drug addict and the homeless inequality ($r = 0.69$), and between the homeowner-homeless and the mentally healthy-mentally ill inequality were stronger ($r = 0.78$). Therefore, while endorsing human-animal inequality is indeed related to human inequalities, there is no correlational evidence in pilot study 2 that human-animal inequality is foundational to human inequalities. The results from pilot study 2 did therefore not support our correlational foundational hypothesis.

It is not surprising that endorsement of inequalities involving the homeless, drug addicts, and the mentally ill are all strongly related.

Perceptions of these groups are often overlapping (e.g., homeless people having both drug addictions and mental health concerns (Christensen, et al., 2005)). Indeed, the results of pilot study 2 sit well with the established idea of generalized prejudice – people who are prejudice towards one group (e.g., women) are likely prejudiced towards other groups (e.g., ethnic minorities) (Pratto, Sidanius, Stallworth, & Malle, 1994).

The lack of support for the correlational foundational hypothesis does raise initial questions about our overall foundational hypothesis. Recent work on the interspecies model of prejudice (Costello & Hodson, 2014) suggests that it is negative evaluations of animals that in turn foster dehumanization of human outgroups. Which is why we expected that support for human-animal inequality should be a stronger predictor of support for human inequalities (e.g., between non-addicts and drug addicts), than other human inequalities (e.g., between the mentally healthy and the mentally ill). As opposed to the direction being, say, negative attitudes towards drug addicts, which then in turn translate to negative attitudes towards animals. What this means, is that further questions are raised about the relationship between different human inequalities, and whether there may be an asymmetrical human inequality (such as towards the mentally ill) which may best predict (and perhaps perpetuate) other human inequalities (such as towards drug addicts). While these may be fruitful suggestions for further work, they are beyond the scope of this thesis (but see the general discussion in chapter 9 for further comments).

The final purpose of pilot study 2 was to identify a comparison group for future studies. In the next chapter, we wanted to examine whether challenging human supremacy over animals can reduce the endorsement of human inequalities. Though we did not have specific hypotheses about which human inequality in pilot study 2 would be endorsed the most, we did compare the means (and standard deviations) of each measure to inform our subsequent experimental studies (in chapter 4). In looking at the level of endorsement of each human inequality, we found that participants endorsed the inequality between non-addicts and drug addicts the most. Consequently, we chose to

challenge non-addict supremacy over drug addicts as the comparison group in our subsequent experimental studies (see chapter 4).

### 4.4 General Discussion

In this chapter, we presented two pilot studies. Initially, we only intended to run one pilot study. Pilot study 1 revealed two human inequalities (that between men and women, and between white Europeans and ethnic minorities) that are not similar to human-animal inequality. Pilot study 2 was then developed to identify human inequalities that were similar to human-animal inequality. The overall goal of the chapter was two-fold. The pilot studies were used to see which human inequalities were similar to human-animal inequality. To do this we developed a scale which captured individual differences in the extent to which people endorse various forms of human and human-animal inequality. The subscales we developed in the pilot studies will now be used as the dependent measure in the subsequent experiments in chapter 4. Additionally, the pilot studies were also used to provide a test for our correlational foundational hypothesis. That is, we wanted to examine whether attitudes towards human-animal inequality were foundational (stronger predictors than endorsement of other human inequalities) to human inequalities.

Running two pilot studies was an important first step in this thesis. The results of the first pilot study (that human-animal inequality was different to the male-female or white European-ethnic minority inequalities) were unexpected, and helped us to think more critically about the various inequalities in society, and which inequalities would be best to use in our subsequent studies (e.g., drug addicts being a more acceptable group to express inequality towards than women). We could have perhaps elicited more variance in our pilot study measures by using a more conservative sample, and so we sampled from a more conservative population in the experiments reported in chapter 4.

In Pilot 1, parallel analyses suggested a two-factor structure for the male-female inequality, and some support for a two-factor structure for the human-animal inequality. However, the first principal components of both human-animal and male-female PCAs revealed quite different factor solutions.

For example, the items about dominance and privilege were present in the male-female solution but absent in the human-animal solution. In addition, the items about superiority and suffering were present in the human-animal solution, but were absent in the human-animal solution. Therefore, we decided to retain the first factor of the human-animal solution because these questions were more closely measuring our construct of inequality. Accordingly, we turned to a second pilot study to identify unequal human intergroup relations that participants thought about in the same manner as human-animal relations.

In our second pilot study, our first important finding was the creation of a short scale with strong face validity, convergent validity, and internal reliability. Our scale can be used to measure attitudes towards both human-animal and human inequalities and captures individual differences in the extent to which participants endorse oppressive relations between two groups. Our second pilot study revealed that the way people think about human-animal inequality more closely resembles more psychologically distant, somewhat removed, and less studied forms of inequality (such as the treatment of drug addicts, the homeless, and the mentally ill) than traditionally studied forms of inequality such as sexism and racism (as used in our first pilot study). Taken together, and to the best of our knowledge, these pilot studies are the first in the published literature on human-animal relations which have pitted various systems of human inequality against human-animal inequality, to examine which human inequality does in fact most resemble human-animal inequality.

In short, creating our scale (and identifying which human inequalities are similar to human-animal ) was an important first step in examining whether oppressing animals is foundational to human forms of . Testing the correlational foundational hypothesis revealed that endorsing human-animal was not foundational to human inequalities. In addition, we wanted to compare the means and standard deviations of the subscales to identify the human group for which people had the least concern. Doing so revealed that the ideal human group to test our experimental foundational hypothesis in chapter 4 is drug addicts. Endorsing the inequality of drug addicts showed strong

correlations with endorsing human-animal inequality, and drug addicts were the human group which participants endorsed the inequality of the most.

Finally, the finding that it was groups on the fringes of moral concern such as drug addicts (not women or ethnic minorities) which best resembled human-animal inequality was interesting. This represents an advancement in theorizing in the psychology of human-animal relations. Going further, we wondered what other human inequality might be conceptualized in the same manner as human-animal inequality. It could be that there are various different overlooked human groups that people oppress and think about in a similar way to human-animal inequality. Indeed, what remains understudied in both human-animal relations and social psychology in general is people's attitudes towards (and participation in) inequality in international relations. This prompted us to include in chapter 4, the even more distant (psychologically and geographically) inequality of that between the UK and Bangladesh sweatshop workers as a dependent variable (to see whether the foundational hypothesis showed spill over to an understudied group of highly oppressed peoples). We chose to use Bangladesh as they are a distant country where many people are thoroughly oppressed to produce clothing in dire circumstances, largely for consumption in the West (Siddiqi, 2009).

### 4.4.1 Limitations

There are certain limitations to this chapter of work. Of most importance would be the method of scale creation. It is possible that we could have conducted exploratory and confirmatory factor analyses in a large sample of up to N=500 for each factor analysis (Haig, 2005). We also could have started with a larger set of measures, and we may have captured the inequalities construct clearer. Indeed, this may have produced a more precise measure. However, while that would have been possible to do, we were also working within certain resource constraints, particularly time and money, which meant we had to make a compromise between creating an ultra-precise measure, versus a 'good enough' measure which we could use in experimental work. We are mindful that the limitations of not conducting exploratory and confirmatory factor analyses are not negligible, and we acknowledge that

doing so would be a fruitful avenue for future research. We chose to go with a smaller sample size for the pilot studies, and to save additional time and money by not doing factor analyses, and instead opted for the use of principal components analyses.

### 4.4.2 Conclusion

The key takeaway from chapter 4 is that support for human-animal inequality more so reflects less common and understudied human inequalities such as the drug addict inequality, than the male-female inequality. In addition, chapter 4 found that support for the human-animals inequality can be reliably measured, is distinct from generalized prejudice such as SDO, and predicts – but is not foundational to – support for human inequalities.

# Chapter Five: A First Examination of the Foundational Hypothesis

## 5.1 Introduction

In chapter 4, two pilot studies revealed that the ideal human inequality for our first experiment is the drug addict inequality. Specifically, the drug addict system produced the same principal components as the human-animal system. Chapter 4 revealed that the way people think about human-animal inequality more closely resembles forms of inequality toward more psychologically distant members of society such as drug addicts (as opposed to women and ethnic others as per pilot study 1). Therefore, in study 1, we chose to also include a measure of support for the Bangladesh inequality we described in chapter 3. In addition, the drug addict inequality was also human inequality which participants in the pilot studies showed the most support for. To initially test the foundational hypothesis, we used correlational analyses in the pilot studies which revealed that endorsing human-animal inequality was not foundational to (a stronger correlate of) other human inequalities.

In chapter 5, we wanted to experimentally test our experimental foundational hypothesis. We wanted to include a thorough test of the experimental foundational hypothesis by ruling out that reducing support for human inequalities did not also translate to a reduction in support for human-animal inequality. We chose to use a self-persuasion task to challenge notions of supremacy because they have previously been shown to effectively change participant's attitudes towards a topic that the participant initially disagrees with, in a cost effective way (Hovland, Janis, & Kelley, 1953). In self-persuasion tasks, participants are instructed to argue for a case that they themselves do not necessarily hold (Wilson T. D., 1990). The idea being that while the task is ostensibly about convincing someone else about the topic, participants are actually persuading themselves while thinking and writing about the topic. We wanted participants to engage with, consider, and challenge their own supremacist beliefs and accordingly chose self-persuasion as our method of attitude change. Further, self-persuasion has been shown to be more powerful and have longer lasting effects than direct persuasion (Aronson, 1999).

Furthermore, self-persuasion has also been shown to reduce prejudice in children (van Dijk, Thomaes, Poorthuis, & de Castro, 2019). Self-persuasion can also be more effective when participants feel they have a sense of agency in the scenario (compared to low agency) (Damen, Müller, van Baaren, & Dijksterhuis, 2015). Finally, self-persuasion has been shown to be more effective at changing explicit versus implicit attitudes (Alhabash, & Wise, 2012).We wanted to develop a type of self-persuasion task that could be easily adapted to challenge both human supremacy over animals, and also supremacy over drug addicts. We decided to have participants simply challenge the idea that one group is superior to another, with the two groups depending on the condition.

We reasoned that having participants write a passage about how humans are not superior to animals would disrupt the dominant notion that humans are superior to animals (Costello & Hodson, 2009), resulting in those participants persuading themselves that humans are not superior to animals. We would then measure participants' endorsement of human-animal and human inequalities. Turning to the other direction – non-addict supremacy impacting on support for human-animal inequality – we also reasoned that if human-animal inequality is foundational to the inequality of humans, then challenging non-addict supremacy should *not* have an impact on the participants' support for human-animal inequality. If, however, we did find that challenging non-addict supremacy reduced support for human-animal inequality, then this would also be an interesting finding. If this were the case, then having participants write a passage about how non-addicts are not superior to drug addicts should show an improvement in attitudes towards the drug addict inequality compared to a control condition. However, those same participants in the drug addicts' condition should not display lower levels of support for human-animal inequality than either the animals or control conditions. We also expected both animal and addicts conditions to produce the same level of attitudes towards the drug addict inequality, and that both groups would display less support for the drug addict inequality than the control condition.

**5.1.1 Correlational hypotheses.** We hypothesized that attitudes towards the human-animal, drug addict, and Bangladesh inequalities would all be positively correlated. That is, people who support one inequality are likely to support other inequalities (Costello & Hodson, 2014). We did not expect that support for human-animal inequality would be asymmetrically correlated to support for human inequalities, as per the results of the pilot studies in the previous chapter.

**5.1.2 Experimental hypotheses.** We predicted that participants who challenge human supremacy over animals would show reduced support for human-animal inequality, *and* reduced support for human inequality (drug addict and Bangladesh inequalities). We predicted that challenging non-addict supremacy over drug addicts would show a reduction in endorsing the drug addict inequality (but not human-animal inequality), compared to the control condition, but not the human supremacy condition; we thought there would be no difference in support for the drug addict inequality between the human supremacy and the non-addict supremacy conditions. We were unsure whether challenging non-addict supremacy would translate to a reduction in support for the Bangladesh inequality.

## 5.2 Method

**5.2.1 Participants.** We wanted to include a more diverse sample than psychology undergraduate students (Henrich, Heine, & Norenzayan, 2010), and so purposefully recruited adult UK participants from across the political spectrum, and a large variety of ages. We were able to do this using the online recruitment website Prolific Academic. Sample size was determined a priori using g*power software. Using $\alpha = .05$; power = .80; and $f = 0.25$ for an ANCOVA with three conditions suggested a minimum of 158 participants (Faul, Erdfelder, Buchner, & Lang, 2009).

The 287 participants (120 Male; Mean age 38.31 years, SD = 12.14) were paid £1.50 and spent on average 10 minutes and 19 seconds (SD = 4 minutes and 7 seconds) to complete the study. The minimum time it took participants to complete the survey was 5 minutes and 56 seconds, and the maximum time was 46 minutes and 15 seconds. In terms of ethnicity, 273

participants self-identified as White European, 3 as Black/ African, 1 as East Asian, 5 as Indian, 4 as multiracial, and 1 as 'other'. Regarding citizenship, 276 participants self-identified as UK citizens, 4 participants were UK permanent residents and one participant stated they were not in the UK. In terms of diet, 156 participants said they were meat eaters, 73 omnivore, 30 had limited meat intake (ate no red meat or ate only fish or chicken), 25 were vegetarian, and 3 were vegan. Participants consented to the study by clicking on the next page button on their computer. Participants completed the study in their own time, and on an internet enabled device of their choice (e.g., cell phone, tablet, desktop computer).

**5.2.2 Design.** Participants were given informed consent, and were then randomly assigned to one of three experimental conditions. Participants were instructed to write a few convincing sentences about their assigned topic. There was no minimum or maximum time limit given to participants, and they could move on to the dependent measures when they decided they had completed the writing task. That is, participants could spend as little or as long on the written task as they needed. Participants were then given the dependent measures, were debriefed and then paid.

**5.2.3 Manipulations**

***Challenging Human Supremacy.*** We wanted to challenge participants' notion of human supremacy over animals. To do this, we had participants challenge the widely held belief that humans are superior to animals (Hodson, Kteily, & Hoffarth, 2014). To help participants get started writing, we gave an example of the positive aspects of other species, and the negative aspects of our own. The first example we gave participants included the lay belief that language is one of the pillars that separates humans from the animal world (Haslam & Loughnan, 2014). Because, of course, there are many other functions or skills that other species have, we wanted participants to consider the skills that other animals have (and that we do not), for instance the ability to fly like birds. The intention was to challenge human supremacy by offering a different perspective on human abilities, and to consider other

animal species' abilities, in the hope that doing so would make human language seem less unique, and therefore human supremacy more fictitious.

We also wanted to give participants another angle to write from, in the form of reminding participants of the violent side of humans. The purpose of this was again to challenge human supremacy over animals, but this time by providing examples of negative human qualities. Reminders that humans can be very violent (Pinker, 2011) might challenge the idea that humans are superior to animals because of the refined emotions humans allegedly exclusively possess. In other words, how can humans be deemed superior to animals when we can be more violent than animals (Haslam & Loughnan, 2014). We gave participants two broad examples to write about, using the following instructions:

"Imagine you have to convince a friend that humans are not superior to animals. The following two ideas might help, or you can use your own ideas!
1. While humans may be superior than animals at some things, such as talking in a language and building houses, there are many things we are not superior at. For example, we cannot swim like fish, or fly like birds, and most mammals are faster than us.
2. Also, there are some bad things humans are better at than animals. For example humans are very good at being cruel, and hurting and killing other people and animals.
In the space below, write a few sentences about how humans are not superior to animals. Allow yourself two or three minutes to write what you would say to your friend in the box below."

***Challenging Non-Addicts Supremacy.*** In the condition of challenging human supremacy, we wanted to challenge participants' notion of non-addicts supremacy over drug addicts (Hari, 2015). To do this, we had participants think about relations between non-addicts and addicts, and to challenge widely held beliefs, or stereotypes about the two (Hari, 2015). We gave an example of the adverse childhood experiences which can increase the likelihood that someone will become addicted to drugs (Dube, et al., 2003), and we gave an example of more commonly used (and socially acceptable) drugs which many people are addicted to, such as caffeine (Olekalns & Bardsley, 1996).

The first example we gave participants included various forms of traumatic childhood experiences, such as growing up in broken homes, or

growing up in poverty (Dube, et al., 2003). The purpose of this was to reduce the personal blame that can be attributed to drug addicted persons (Harris & Fiske, 2006), by reminding participants of the factors which are beyond the control of the drug addicted individual, which may contribute to their becoming addicted to drugs (Dube, et al., 2003). Doing so should challenge the notion of non-addicts supremacy over drug addicts (Harris & Fiske, 2006). In addition, we gave another example that reminds participants that people become addicted to many other socially acceptable drugs such as alcohol (Olekalns & Bardsley, 1996). Doing so should make the drug addict seem more similar, and by extension less inferior (Bastian, Costello, Loughnan, & Hodson, 2012). Participants were instructed with the following:

"Imagine you have to convince a friend that people who do not take drugs are not superior to people who are addicted to drugs. The following two ideas might help, or you can use your own ideas!

1. People who are addicted to drugs often come from broken homes, grew up in poverty, or experienced trauma or neglect when they were small children, therefore they are not bad people, but are people who have had bad things happen to them.
2. While some people are addicted to 'hard drugs' like cocaine and heroin, a lot of people are addicted to 'softer drugs' such as alcohol, cigarettes, tea, or coffee. In this way, a lot of people are addicted to things, but some addictions are more socially acceptable than others.

In the space below, write a few sentences about how people who do not take drugs are not superior to people who take drugs. Allow yourself two or three minutes to write what you would say to your friend in the box below."

***Control condition.*** In the control condition, we wanted participants to similarly challenge a notion of supremacy in a self-persuasion writing task. However, we wanted the topic to be less contentious than drug addiction, and so asked participants to write about relations between people who read books, and people who watch television. We asked participants to write why people who read books are not superior to people who watch TV. The examples we gave were that watching TV could be more relaxing than reading a book, and that watching TV can be a more social past time. The control condition was designed to be structured the same as the other two conditions, but with the content of the control condition being an uncontentious or silly notion of

supremacy (because in the UK most people have both read books and watched TV). We instructed participants in the following:

“Imagine you have to convince a friend that people who read books are not superior to people who watch TV. The following two ideas might help, or you can use your own ideas!

1. People who watch TV can find the activity more relaxing, as it is less strenuous than reading a book, thus they can more enjoyment from their leisure time.
2. Also, people tend to read different books and so chatting about books is harder than chatting about TV shows, as people tend to watch the same shows.

In the space below, write a few sentences about how people who watch TV are not superior to people who read books. Allow yourself two or three minutes to write what you would say to your friend in the box below.”

### 5.2.4 Measures

***Human-animal inequality.*** To measure support for human-animal inequality, we used our 4-item measure created in pilot 2 of chapter 2. The scale had good internal reliability, α = 0.76, 95% CI [0.72, 0.81].

***Drug addict inequality.*** To measure support for the drug addict inequality, we used our 4-item measure created in pilot 2 of chapter 2. The scale had good internal reliability, α = 0.80, 95% CI [0.76, 0.84].

***Bangladesh inequality.*** To measure support for the Bangladesh inequality, we created a 4-item measure, similar to those created in pilot 2 of chapter 2. The scale consisted of the 4 items, British people are superior to sweatshop workers from Bangladesh; It is okay that British people benefit from the current order of society; It is okay that sweatshop workers from Bangladesh suffer from the current order of society. I accept the way British people treat sweatshop workers from Bangladesh. Participants answered the questions on a sliding scale from 0 (Not at all) to 100 (Completely). The scale had good internal reliability, α = 0.86, 95% CI [0.83, 0.88]. In addition, a Principal Components Analysis with manual extraction of one component supported the solution containing the 4-items, $X_2$ (2) = 51.26, $p$ < .001. Note: the inclusion of the Bangladesh inequality was developed after the pilot studies had been conducted.

***Social Dominance Orientation (SDO).*** Participants support for group-based inequality was measured with a validated 4-item measure of Social Dominance Orientation taken directly from (Wilson & Liu, 2003). Participants were asked "for each of the following questions about groups in general, indicate whether you think the statement is positive or negative:" Winning is more important than how the game is played; Getting ahead by any means necessary; Sometimes war is necessary to put other countries in their place; Inferior groups should stay in their place. The scale was anchored from 1 (Very Negative), through 3 (Neutral), to 5 (Very Positive), and had good internal reliability, $\alpha = .78$, 95% CI [0.73, 0.82].

***Political Orientation.*** To capture individual differences in participant's political orientation, we used a one-item measure asking how left-wing or right wing participants were. Participants answered the question from 0 (left wing) to 100 (conservative).

***Age.*** To measure participants age, we asked participants "how old are you?", and participants entered their age in a text box (e.g., 21).

***Gender.*** To measure participants' gender, we asked participants to select one of three categories that were: male, female, or other.

***Ethnicity.*** To measure participants' ethnicity, we asked participants to select one of eight categories that were: white/European, Black/African, Hispanic, East Asian, Indian, Arab, Multiracial, or Other.

***UK citizenship.*** To measure participants' citizenship status, we had participants select one of four options that were: UK citizen, UK permanent resident, UK student visa, or not living in the UK.

***Diet.*** To measure participants' diet, participants were asked what best describes your diet and were given the following six options: Meat eater, omnivore, limited meat intake (no red meat), limited meat intake (only fish or chicken), vegetarian, or vegan.

***Warmth.*** Participants were given a single item measure of warmth towards each target group. Participants were asked to rate how warm they felt towards each target group using a feeling thermometer, from cold (0) to warm (100).

## 5.3 Results

**5.3.1 Analysis strategy.** We employed both frequentist (SPSS software) and Bayesian analyses (JASP software), and ran different models with and without SDO as a covariate. Unlike null hypothesis significance testing, Bayesian model comparison allows for tests in favour of the null hypothesis. Bayesian analyses also allows for model comparison between the null, the covariate, the independent variable, and the independent variable controlling for the covariate. We also ran our main analyses with and without the ethnic minorities and vegetarians/vegans. For simplicity, we report Bayes factors alongside null hypothesis significance tests, although we conducted these tests separately

**5.3.2 Preliminary data treatment.** Originally, 298 participants took part in the survey. We removed 11 participants because they did not follow instructions in the essential writing task (i.e., they wrote in favour of the wrong side of the argument, or wrote so little their argument could not be deciphered) which left us with 287 participants for analyses. However, when looking at the participants written responses, we noticed that in the control condition, around one quarter of participants (27) wrote in the wrong direction of the argument (e.g., that people who watch TV are not superior to people who read books). In looking at the survey on qualitrics, we noticed that there was an error in the control manipulation, which stated for participants to both write that people who read books are not superior, and then it instructed participants to write about how people who watch TV are not superior (conflicting instructions). We therefore wanted to see whether there was a difference between instructions people followed, and their scores on the dependent measures.

We ran an independent samples Bayesian T-test, with the direction of the participants written response as a between subjects factor (book readers are not superior to TV watchers versus TV watchers are not superior to people who read books), on their endorsement of human-animal inequality. The results revealed there was inconclusive evidence that participants who wrote about book readers not being superior ($N$ = 71, $M$ = 41.20, $SD$ = 18.92) scored different on human-animal inequality measure ($N$ = 27, $M$ = 45.50, $SD$ = 17.95),

$BF_{10}$ = 0.37. Because of this result, we decided to keep the participants in the control condition together. It is noteworthy that the purpose of the control condition was to challenge a form of supremacy between two groups where there is no inequality (i.e., book readers and TV watchers), so we did not anticipate seeing any differences between groups, irrespective of whether the book readers or the TV watchers were deemed superior in the task. The next study (in chapter 4) rectified this error by making sure the manipulation wording was correct.

**5.3.3 Missing data.** 40 participants had missing data, the majority of which were just missing an answer to one or two questions in the dependent measures. The missing data was replaced with the mean of the scale (50) as in the pilot studies.

**5.3.4 Correlational results.** Please see Table 5.1 below for correlations, frequentist p-values, and Bayes factors between all variables in study 1. Supporting our correlational hypotheses, the attitudes towards all three inequalities (human-animal, drug addict, and Bangladesh) were all positively correlated. Attitudes towards animals were again not more strongly correlated with the human target groups than the other human group, and vice versa. These correlational results provide further evidence that human-animal inequality is not asymmetrically correlated to human inequalities.

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the drug addict and Bangladesh inequalities. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO, was more strongly correlated with attitudes towards the human groups.

When looking at warmth, feelings of warmth towards animals was negatively correlated with support for human-animal inequality, but was not correlated with attitudes towards human inequalities. Warmth towards animals was also not correlated with warmth towards drug addicts, but was correlated with warmth towards Bangladesh workers. Warmth towards drug addicts was strongly negatively correlated with support for the drug addict inequality, and so too was warmth towards Bangladesh workers and support for the

Bangladesh inequality. Feelings of warmth towards drug addicts were also positively correlated with warmth towards Bangladesh workers.

Table 5.1. Showing Pearson correlations, frequentist p-values, and Bayes factors, between all variables in study 1.

| Variable | | 1.Human-Animal | 2.Drug addict | 3.Bang-ladesh | 4.SDO | 5.PO | 6.Animal warmth | 7.Addicts warmth | 8.Workers warmth |
|---|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.38 | | | | | | | |
| | p | < .001 | | | | | | | |
| | $BF_{10}$ | 3.81e+8 | | | | | | | |
| 3 | r | 0.41 | 0.62 | | | | | | |
| | p | < .001 | < .001 | | | | | | |
| | $BF_{10}$ | 4.87e+10 | 3.47e+28 | | | | | | |
| 4 | r | 0.30 | 0.48 | 0.54 | | | | | |
| | p | < .001 | < .001 | < .001 | | | | | |
| | $BF_{10}$ | 1.23e+5 | 1.31e+15 | 1.11e+20 | | | | | |
| 5 | r | 0.20 | 0.48 | 0.42 | 0.48 | | | | |
| | p | < .001 | < .001 | < .001 | < .001 | | | | |
| | $BF_{10}$ | 37.09 | 3.11e+15 | 1.70e+11 | 1.23e+15 | | | | |
| 6 | r | -0.36 | -0.02 | -0.12 | -0.07 | 0.04 | | | |
| | p | < .001 | 0.378 | 0.018 | 0.106 | 0.759 | | | |
| | $BF_{10}$ | 3.16e+7 | 0.10 | 1.29 | 0.29 | 0.05 | | | |
| 7 | r | -0.16 | -0.60 | -0.33 | -0.35 | -0.40 | 0.05 | | |
| | p | 0.003 | < .001 | < .001 | < .001 | < .001 | 0.186 | | |
| | $BF_{10}$ | 6.19 | 8.42e+26 | 1.11e+6 | 1.21e+7 | 8.22e+9 | 0.04 | | |
| 8 | r | -0.20 | -0.35 | -0.44 | -0.32 | -0.18 | 0.18 | 0.35 | - |
| | p | < .001 | < .001 | < .001 | < .001 | 0.002 | 0.008 | < .001 | - |
| | $BF_{10}$ | 34.27 | 1.21e+7 | 3.47e+12 | 5.61e+5 | 11.30 | 2.70 | 1.09e+7 | - |

Note: r = Pearson correlation; p = p-value; $BF_{10}$ = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh = inequalities; Workers warmth = warmth towards Bangladesh sweatshop workers.

It is interesting to note that feelings of warmth only correlate low to moderately with support for the inequality, for both humans and animals, and British and Bangladesh people, and that warmth and support for the inequality was only strongly correlated for drug addicts. This is interesting because most people in the study likely contribute to the inequality of both animals and Bangladesh people (via their consumption of meat/animal products and their consumption of sweatshop clothing from Bangladesh), more directly than they do contribute to oppressing drug addicts. From the correlational results, participants' feelings of warmth (or coldness) towards drug addicts are more aligned with participants support for the drug addict inequality, than were the correlations between the other target groups. Whereas for the human-animal and the Bangladesh inequalities, the weaker relationship between endorsing the inequality and feelings of warmth, suggest that participants' feelings of warmth and acceptance of inequality are not as tightly aligned as they are for drug addicts. This discrepancy between feelings of warmth and support for human-animal inequality is consistent with research on the meat paradox (Bastian & Loughnan, 2017).

### 5.3.5 Experimental Results

***Human-animal inequality.*** To examine whether there were differences in participant's support for human-animal inequality, we conducted a one-way analysis of variance (ANOVA), with condition as a between subjects factor. We ran our ANOVA with and without SDO as a covariate, to control for individual differences in SDO.

Please see Figure 5.1 below for the mean level of support for human-animal inequality per conditions. See also Figure 4.7 at the end of this section for a graph showing mean level of support for all three inequalities, by condition.

Contrary to the hypothesis, the ANOVA revealed no significant difference in the support for human-animal inequality between conditions, $F(2, 284) = 1.42$, $p = 0.244$, $\eta_p^2 = 0.01$, $BF_M = 4.26e\text{-}6$. That is, both the animals ($M = 38.04$, $SD = 19.47$) and the addicts condition ($M = 38.63$, $SD = 18.72$) showed slightly, but not significantly less support for human-animal inequality

than the control condition (*M* = 42.24, *SD* = 18.57). Levene's test for equality of variance was not violated, *F*(2, 284) = 0.08, *p* = .928. When including SDO in the model, SDO was a significant covariate, *F*(1, 283) = 30.90, *p* < .001, $\eta_p^2$ = 0.10, $BF_M$ = 8.88 and the overall model improved and became marginally significant, but was not supported by Bayesian analyses, *F*(2, 283) = 2.46, *p* = 0.087, $\eta_p^2$ = 0.02, $BF_M$ = 1.01.

Bayesian model comparison results showed good support for SDO predicting support for human-animal inequality, inconclusive evidence that condition and SDO together predicted support for human-animal inequality, and strong evidence against a main effect of condition. Bayesian model comparison also revealed strong evidence against the null model, $BF_M$ = 3.139e -5. To sum, Bayesian model comparison revealed that individual differences in SDO best predicted attitudes towards human-animal inequality, suggesting there was inconclusive evidence that our manipulation had an effect on support for human-animal inequality.

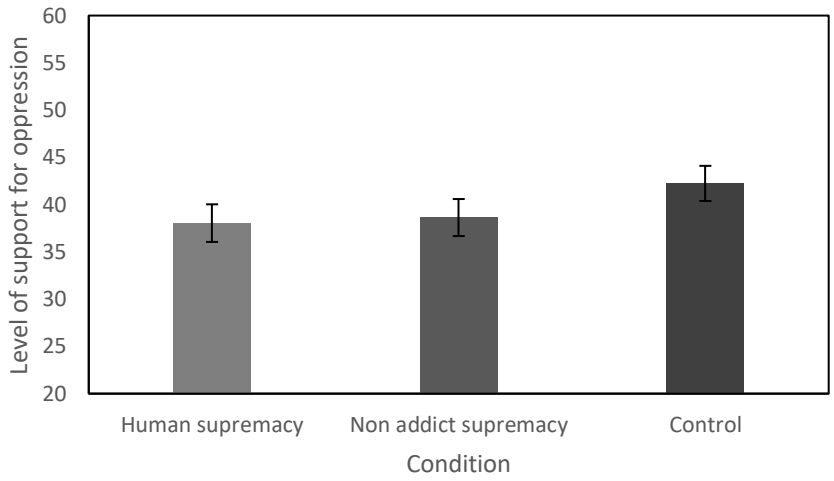


*Figure 5.1.* Showing no difference in the mean level of support for human-animal inequality per condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards animals.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards animals. See Figure 5.2 below for the mean feelings of warmth towards animals per conditions. The results revealed no significant difference in feelings of warmth towards animals between conditions, *F*(2, 284) = 0.09, *p* = 0.913, $\eta_p^2$ = 0.00, $BF_M$ = 0.10.

Participants in the animal (*M* = 80.93, *SD* = 17.23), addicts (*M* = 80.49, *SD* = 21.32), and control conditions (*M* = 81.63, *SD* = 17.25) all displayed high levels of warmth towards animals. When controlling for SDO, an ANCOVA showed SDO was not a significant covariate $F(1, 283) = 1.48$, $p = 0.224$, $\eta_p^2 = 0.01$, $BF_M = 0.77$, and the model remained non-significant, $F(2, 283) = 0.06$, $p = 0.943$, $\eta_p^2 = 0.00$, $BF_M = 0.03$. Further, Bayesian model comparison showed support for the null model, $BF_M = 9.27$, providing good evidence there was no effect of condition or SDO in predicting warmth towards animals.

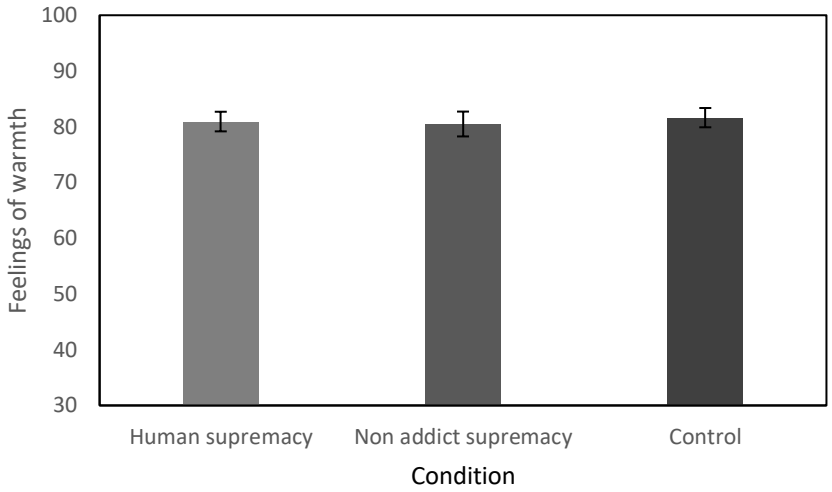


*Figure 5.2.* Showing no difference in the mean feelings of warmth towards animals per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Drug addict inequality.*** To examine whether there were differences in participant's support for the drug addict inequality, we conducted a one way analysis of variance (ANOVA), with condition as a between subjects factor. Again, we ran our ANOVA with and without SDO as a covariate, to control for individual differences in SDO. See figure 5.3 below for the mean level of support for the drug addict inequality per condition.

Supporting our hypothesis, the ANOVA revealed a significant difference in the support for the drug addict inequality between conditions, $F(2, 284) = 4.67$, $p = 0.010$, $\eta_p^2 = 0.03$. However, contrary to our hypothesis, the animals condition (*M* = 33.19, *SD* = 23.36) did not show significantly less support for the drug addict inequality compared to the control condition (*M* = 34.30, *SD* = 19.91). In addition, post-hoc comparisons with Bonferoni adjustments revealed

the drug addicts condition (*M* = 25.63, *SD* = 19.88) displayed less support for the drug addict inequality than both the animals, 95% CI [-15.00, -0.12], and the control condition, 95% CI [-16.04, -1.30]. However, dissimilar to the frequentist analysis, Bayesian post hoc comparisons suggested there was inconclusive support for the difference between the addicts and animals condition, $BF_{10,U}$ = 2.16, and good support for the difference between the addicts and the control condition $BF_{10,U}$ = 10.08. Levene's test for equality of variance was not violated, $F(2, 284) = 1.42$, $p = .243$. When including SDO in the model, SDO was a significant covariate, $F(1, 283) = 91.83$, $p < .001$, $\eta_p^2$ = 0.25, $BF_M$ = 0.08, and the overall model improved, $F(2, 283) = 7.83$, $p < .001$, $\eta_p^2$ = 0.05, $BF_M$ =120.58.

Bayesian model comparison showed strong support that the model including SDO as a covariate best explained the variance in support for the drug addict inequality, and weak evidence for SDO alone predicting support for the drug addict inequality. In addition, Bayesian model comparison revealed very strong evidence against the null model, $BF_M$ = 1.383e -16, and very strong evidence against a main effect of condition, $BF_M$ = 3.468e -16. Taken together, these results suggest that the drug addict's manipulation revealed a difference in support for the drug addict inequality between conditions, when controlling for individual differences in SDO.

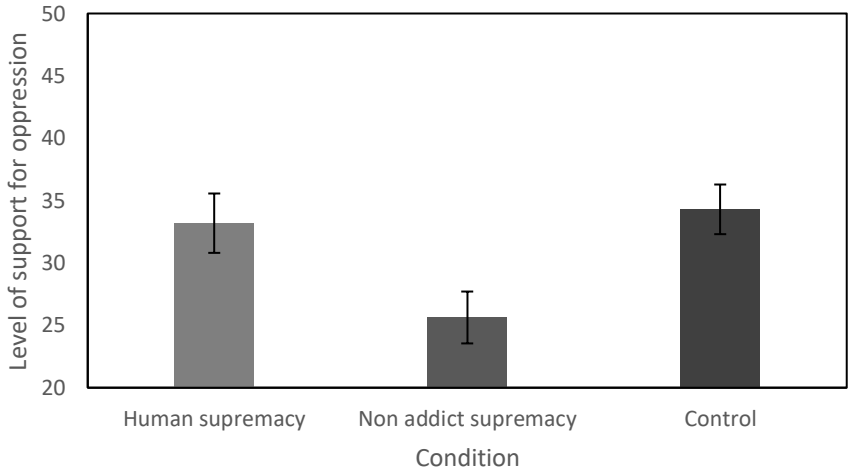


*Figure 5.3* Showing participants in the non-addict supremacy condition revealing lower support for the drug addict inequality than the control condition,

and marginally less than the human supremacy condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Warmth towards drug addicts.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards drug addicts. See Figure 5.4 below for the mean feelings of warmth towards drug addicts per condition. The results revealed a significant difference in feelings of warmth towards drug addicts between conditions, $F(2, 284) = 4.68$, $p = .010$, $\eta_p^2 = 0.03$. Participants in the addicts condition ($M = 47.33$, $SD = 21.59$) displayed higher levels of warmth towards drug addicts than both participants in the animal ($M = 37.44$, $SD = 24.19$), and control conditions ($M = 40.49$, $SD = 21.90$). Pairwise comparisons with Bonferoni adjustments, and Bayesian post hoc comparisons revealed that only the difference between the animals and addicts condition was significant, $p = .009$, 95% CI [-17,85, -1.93], $BF_{10,U} = 8.52$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 283) = 41.01$, $p < 0.001$, $\eta_p^2 = 0.13$, $BF_M = 0.53$, and the overall model remained significant, $F(2, 283) = 5.62$, $p = .004$, $\eta^2_p = 0.04$, $BF_M = 17.01$. In short, unlike warmth towards animals, warmth towards drug addicts was best predicted by the between subjects factor of condition, while controlling for individual differences in SDO.

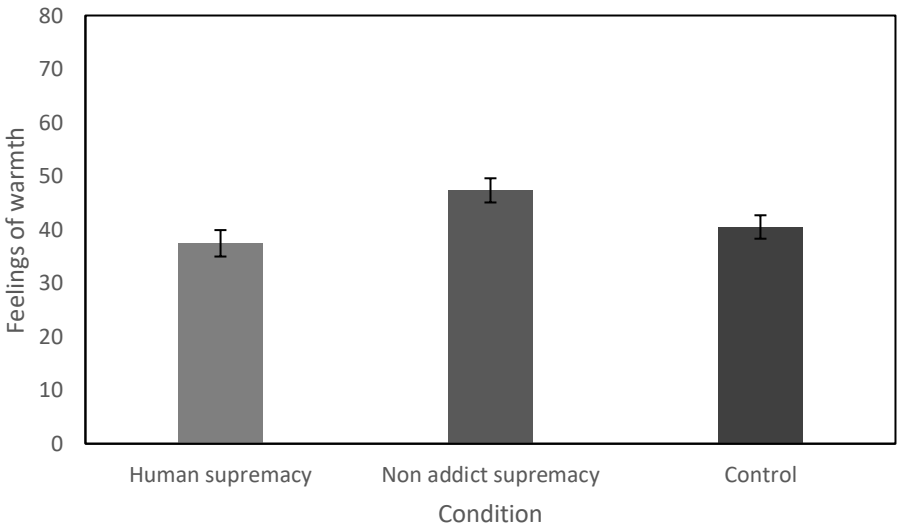


*Figure 5.4.* Showing participants in the non-addict supremacy condition had warmer feelings towards drug addicts than participants in the human-animal condition, and marginally more than the control condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Bangladesh inequality.*** To examine whether there were differences in participant's support for the Bangladesh inequality, we conducted a one way ANOVA, with condition as a between subjects factor. Again, we ran our ANOVA with and without SDO as a covariate, to control for individual differences in SDO. See figure 5.5 below for the mean level of support for the Bangladesh inequality per condition.

In contrast with our hypothesis, the ANOVA revealed no significant difference in the support for the Bangladesh inequality between conditions, $F(2, 284) = 1.08$, $p = .342$, $\eta_p^2 = 0.01$, $BF_M = 6.020e\text{-}21$. The animals condition ($M = 22.23$, $SD = 21.86$) did not show significantly less support for the Bangladesh inequality compared to the control condition ($M = 21.10$, $SD = 19.81$) or the addicts condition ($M = 18.05$, $SD = 18.41$). Levene's test for equality of variance was not violated, $F(2, 284) = 1.78$, $p = .171$. When including SDO in the model, SDO was a significant covariate, $F(1, 283) = 117.36$, $p < .001$, $\eta_p^2 = 0.29$, $BF_M = 12.49$, and the overall model improved, but remained non-significant, $F(2, 283) = 2.11$, $p = .123$, $\eta_p^2 = 0.02$, $BF_M = 0.72$. Bayesian model comparison also revealed very strong evidence against the null model, $BF_M = 6.066e\text{-}20$. Taken together, Bayesian model comparison revealed there was inconclusive evidence that there was an effect of condition on support for the Bangladesh inequality, and good evidence that SDO alone best predicted support for the Bangladesh inequality.

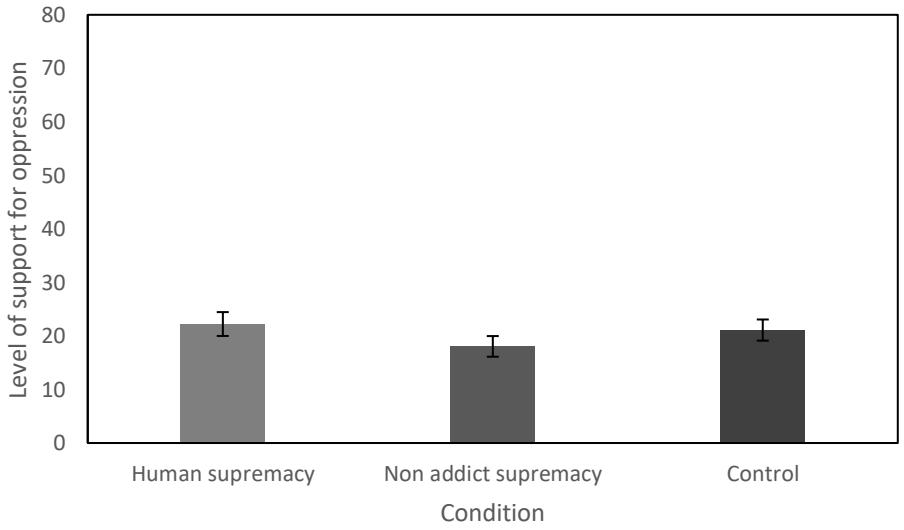

*Figure 5.5.* Showing no difference in the mean level of support for the Bangladesh inequality per condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards Bangladeshi workers.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards Bangladesh workers. See Figure 5.6 below for the mean feelings of warmth towards Bangladeshi workers per condition. The results revealed no significant difference in feelings of warmth towards Bangladesh workers between conditions, $F(2, 281) = 2.08$, $p = .126$, $\eta_p^2 = 0.02$, $BF_M = 1.824e\text{-}6$. Participants in the addicts condition ($M = 74.04$, $SD = 21.26$) displayed higher levels of warmth towards Bangladesh workers than both participants in the animal ($M = 67.03$, $SD = 25.97$), and control conditions ($M = 70.40$, $SD = 22.86$), but these differences were not significant. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 280) = 32.48$, $p < .001$, $\eta_p^2 = 0.10$, $BF_M = 10.11$, however, the overall model remained non-significant, $F(2, 280) = 2.30$, $p = .102$, $\eta_p^2 = 0.02$, $BF_M = 0.89$. Bayesian model comparison also revealed very strong evidence against the null model, $BF_M = 7.345e\text{-}6$. That is, similar to attitudes towards Bangladesh workers, Bayesian model comparison revealed there was inconclusive evidence of an effect of condition on the dependent variable, and good evidence that SDO alone best predicted warmth towards Bangladesh workers.

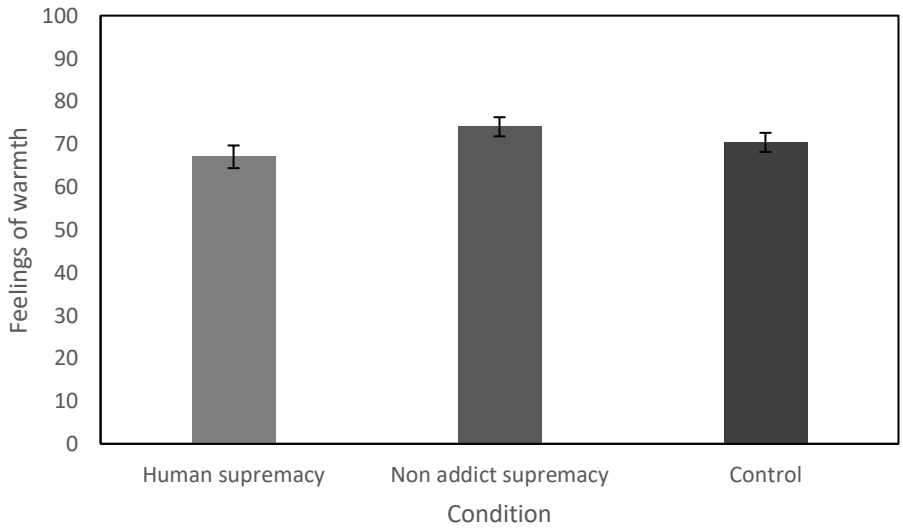

*Figure 5.6.* Showing no difference in the mean feelings of warmth towards Bangladesh workers per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Post Hoc Bayesian Analyses.*** Because the limited research on human animal relations most relevant to the current work sometimes excludes vegetarians (Bastian, Costello, Loughnan, & Hodson, 2012) and sometimes excludes ethnic minorities (Costello & Hodson, 2009) in their samples, we then removed 3 vegans and 25 vegetarians, leaving a sample of 259. We further removed 14 participants who did not self-identify as white Europeans, leaving a final sample of 245 white European meat eaters. We then re ran the main analyses (support for the human-animal and human inequalities) using Bayesian analyses, which is robust to multiple post-hoc comparisons on the data set. All effects remained the same as with the full sample. That is, the two effects we found support for (drug addicts covariate models for main DV and warmth) remained, and all other main effects and ANCOVAs remained unsupported.

**5.3.6 Qualitative Analyses.** In study 1, we found that the drug addicts' manipulation had a significant effect on the support for the drug addict inequality. This effect held when controlling for SDO, and with and without vegetarians, vegans, and ethnic minorities. We then wondered why there was no effect on endorsing human-animal inequality in the human supremacy condition. To begin answering this question, we turned to what the participants wrote about in the human supremacy condition, to see whether there were differences in what participants wrote about.

***Method.*** To analyse the written response participants completed as part of their manipulation, we turned to content analyses, which is used to reduce written language down into smaller content categories (Elo & Kyngas, 2008). We used an inductive approach to the content analysis because we had no prior knowledge about what categories to sort the content into and we needed to derive the categories from the data (Elo & Kyngas, 2008). The unit of analysis in content analysis can be the word, a sentence, or a paragraph. Consequently, we opted for the 'category' level distinction, whether that was written in a few words, or a few sentences. We also opted only to focus on

manifest content (explicit) and did not read into latent content (hidden meanings or interpretations of the response).

***Procedure.*** We read the written answers participants gave to get a sense of what was being written. We then went through the qualitative data again, this time making comments about the main points of their argument. The purpose of the content analysis is to reduce the data down to key topics that participants used to make their arguments. We wanted to see whether the frame or content of their argument was related to their results on the dependent measures.

***Results.*** We found that there were 3 main topics that participants chose to write about. Participants tended to write about (1) the notion of supremacy is arbitrary (2) negative human qualities, or (3) providing positive descriptions of animals. However, within each category, there were also other subcategories which were not examined empirically, but which provide insight into the types of thoughts that sprang to mind when participants were asked to support the notion that humans are not superior to animals.

*The notion of supremacy is arbitrary.* The category that was the most distinct (but also the least used), was challenging the validity and legitimacy of the argument itself. For example, 5 participants suggested that the notion of superiority was itself invalid because of its subjective nature. For example, one participant began by writing:

“The only way you could say that humans are "superior" is by defining "superior" to mean the things that humans are good at”.

This response illustrates an insightful and thoughtful response to the manipulation. The same participant went on to describe how subjective and anthropocentric (human centric) the notion of human supremacy is, by illustrating how another animal might think about supremacy:

“..I'm sure if you asked a cat what the definition of "superior" is, the cat would say its sharp claws and the ability to catch small animals”.

However, a common theme throughout the content analysis was that participants often wrote about more than one example, and so imposing categories on them was a difficult task. For instance, the same participant then

went on to describe some of the negative qualities of humans, which is another category in itself (which we get to below):

"..We do have some unique properties among animals, but it seems they are mainly wasted on us as we just seem to mess things up using them."

Another participant wrote about the arbitrary nature of supremacy in the following way:

"The claim that humans are superior to animals is almost meaningless in that we are attempting to apply an entirely human concept (superiority in a general sense) to creatures which by their nature do not recognise this concept."

This response reveals again that the concept of 'humans being superior to animals' is anthropocentric, and based on things which humans may claim to be the important criteria for saying one is superior to another. That is, the notion of supremacy is open to interpretation. The same participant goes on to provide a rich explanation and further analogy:

"While it may be true that if you select certain metrics which humans consider important (intelligence, language, ability to dominate) then you can say that humans score higher, all this proves is that the things humans select measures which place them above animals when attempting to consider where they stand. This claim appears to be like a plumber claiming superiority over a builder because they're better at dealing with plumbing."

*Negative human qualities.* A second category arose which comprised of the negative qualities of humans. Participants either wrote about humans being cruel and evil, or humans having poor animalistic qualities (e.g., being bad at hunting and survival), or a combination of the two. For example, one participant focussed on the bad qualities of humans, such as:

"We are the only species that kill other species for reasons other than hunger. We are also the only species that is wrecking the environment, leaving us with nowhere to live in the future. Our greed has overtaken common sense, and our intelligence has moved us out of a normal evolutionary cycle, where the fittest survive."

This participant's response contains information about humans killing unnecessarily (e.g., not for food). However, while this response provides some

negative aspects of humans, providing the idea that killing is okay when one can justify it (such as when one is 'hunger') does raise questions about reinforcing human supremacy by justifying the killing of animals. In addition to some of the negative things humans do, another participant wrote that unskilled aspects of human nature:

"..We are weak when we are first born and take 16-20 years to fully develop whereas some animals can fend for themselves after a few hours of being born."

The idea of humans being weak and lacking survival skills came up in other ways. For example, another participant wrote that:

"Humans though have higher intellect than animals but their other senses have dimmed or have lost its sharpness, for example the sense of sight, touch, hearing, taste etc. Larger cranial capacity came at the cost of these senses. While animals are very good at these senses and are adapted to its habitat in a much better manner than the humans."

This response begins with a caveat that humans have higher intellect than animals, but that this has come at the cost of other senses being dimmed. This was a common response for participants who wrote about negative human qualities, and that participant then went on to describe times when animals show compassion, and are more thoughtful in their killing. For example:

"Animals show aggression only when they are hungry or for self-defence and will not hurt for any other reason, unlike humans. Animals are not calculative, greedy and self-centred like humans."

This participant therefore provided examples of both humans being bad, and animals being good in their response. Alongside reporting more than one concept in their response, another difficulty in the qualitative results were those participants whose response were in ways unintelligible. For example, one participant began by writing that:

"If we didn't have tools/technology, we would be quite low on the food chain…would you fight a lion a bear, monkey without something to defend yourself with [?]"

However, while this could be seen as a criticism of human supremacy, this participant then went on to write:

“but as a human brain work[s] in a far more complex way we have adapted as you can see by how [far] we have advanced with tools etc. rather [than] must eat to live living style and have strength rather [than] brains, we are no different from any animal as we also have this built in as we do require food to eat so we just go a shop not the local watering pool for a chance to eat.”

As can be seen, this participants’ writing becomes quickly unclear, and difficult to interpret. While this was not frequently observed, the legibility of the responses, and perhaps how persuasive responses are, may be fruitful avenues for future research on self-persuasion and human animal relations to include.

*Positive animal qualities.* Complementing those who wrote about the downfall of humans, others chose to write about the positive qualities of animals. These responses included two main subgroups; that animals had better animalistic and survival qualities than humans, or that animals were kind and not as malicious as humans. For example, this response below captures well the two key categories of positive animal qualities:

“Most animals have a superior sense than humans, be that smell or sight or hearing. Dogs have infinitely better sense of smell, birds have better eyesight and bats can hear better. They only hunt to eat and not for pleasure. They are far more resourceful than humans and can survive extremes in temperature far better.”

This response included examples of animals having sharper senses than humans; that animals are more considerate (hunters) and resourceful than humans. Other examples that animals have sharper senses than humans surround the idea that animals can fend for themselves earlier on in life than humans. For example, one response started with:

“Most animals are relatively independent after a few weeks of being born, out can walk within days. Humans rely on the constant supervision of parents, in most cases, for over a decade. Usually contributing nothing to the species in this time.”

However, while this participant included positive things about animals, they also included negative things about humans, specifically that children contribute nothing to the species when they are young. In short, there were three main categories surrounding what participants chose to write about. These were that the idea of human supremacy is arbitrary, the idea that humans do many bad things, and the idea that animals can do very good things. In addition to these responses, there were some additional interesting responses that are beyond the scope of analysis here. These include the idea that 'humans are actually animals', and that 'humans and animals are equal in many ways'.

Another way of interpreting the data could have been the types of animal species which participants compared humans to. For instance, it could be that the term 'animal' means different things to different people. For the most part, participants did not actually mention a specific animal species, and just wrote about 'animals' in their responses. However some participants did. Of those, participants either wrote about wild majestic animals, such as lions, elephants and tigers; fish who swim in the open seas, or birds who can fly – presumably they were not thinking about fish in private fish tanks, or birds in captivity. In addition, some participants also mentioned domestic dogs as examples of well natured animals. It would be interesting to explore further whether using specific animals, or categories of animals (such as farm cattle and sheep, wild, carnivorous, or herbivorous animals) would have an impact on the psychological process that occurs for participants during the manipulation. It may be that challenging human supremacy over majestic animals (such as lions or tigers), may not improve attitudes towards humans so much as challenging attitudes towards those animals we routinely exploit, such as farm animals and domestic pets. To sum, the qualitative aspect of the research in this chapter informed us that using different groups of animals such as (wild vs farmed vs pets) might be promising avenues for future research, but are questions which are beyond the scope of this thesis.

**Discussion.** Taken together, while there are many different ways of interpreting and categorizing the qualitative data, our content analysis yielded

three categories to be used in a further analysis, where we employed a research assistant (RA) to code each written answer into one of the three categories that were developed. We would then test if there were any differences in the support for human-animal inequality, based upon what participants wrote about in the human supremacy manipulation. The RA who coded the responses was blind to hypotheses.

***Qualitative content Bayesian analysis.*** The purpose of analysing the RA's findings were to see whether the three categories developed in the content analysis had an impact on the dependent measures. If there was a difference, then this would direct our manipulations in the subsequent studies, and inform whether we should use a more specific manipulation wording in the human supremacy condition.

***Method.*** The RA classified each written response in the human supremacy condition based off the three following groups. The coder was instructed to use whole sentences or paragraphs to decide which category to place participants in. We originally planned to use 2 coders to be able to test for inter-rater reliability, however, only one of our coders completed the task, and we therefore could not compute inter-rater reliability. The RA helped with this research as part of a volunteer work experience program in the department of psychology at the University of Edinburgh (not paid or given course credit). The three categories the RA had to place each participant's qualitative response into were the three categories that emerged from our content analysis.

1. The notion that humans are superior to animals is arbitrary
2. Focus is on humans (e.g., humans do bad/cruel things, humans are useless hunters etc.)
3. Focus is on animals (e.g., animals are faster than us/ better swimmers etc., or animals are kind etc.)

However, in qualitative research, often an answer can go into numerous different categories. To keep things simple, the research assistant was therefore also instructed that if people wrote about more than one of the above 3 categories, to use their own judgement as to which category best fits, based

off of which is most written about, or which is written about first, or what the research assistant thought made better sense.

***Results.*** To analyse the research assistants' analysis of the qualitative data, we used Bayesian analysis, which is more robust to unequal sample sizes than frequentist statistics. We ran a one-way ANOVA with content category as a between subjects factor (arbitrary vs. focus on humans vs focus on animals), on human supremacy. The results revealed that there was inconclusive evidence for the null model, $BF_{10}$ = 0.27, and inconclusive evidence for the main effect of condition, $BF_{10}$ = 0.12. When including SDO as a covariate, the results revealed moderate evidence for SDO predicting support for human-animal inequality, $BF_{10}$ = 4.05, and inconclusive evidence that condition with SDO partialled out predicted support for human-animal inequality, $BF_{10}$ =1.32. Participants who wrote about the arbitrary nature of human supremacy (*M* = 23.65, *SD* = 23.96, *N* = 5), endorsed human-animal inequality less than participants who wrote about humans being bad (*M* = 39.75, *SD* = 18.95, *N* = 55), or participants who wrote about animals being good (*M* = 35.15, *SD* = 19.99, *N* = 34), however, the difference were not significant. It is important to note the small sample size of (*N* = 5) for the human supremacy is arbitrary condition, which means that caution should be taken in interpreting any results with a sample this small, as any data point has a much stronger effect on the means and SD compared to larger samples.

***Discussion.*** Taken together, analysing the results of the RA's coding provided inconclusive evidence for or against a meaningful difference based upon what was written in the animal condition. In short, there was inconclusive evidence that the content of the human supremacy manipulation had an impact on support for human-animal inequality.

## 5.4 Discussion

**5.4.1 Correlational Results.** First looking at our correlational results, we found that support for human-animal and human inequalities (i.e., drug addict, and Bangladesh) were all positively correlated. Similar to pilot study 2 in chapter 2, and supporting our predictions, we again did not find support for the correlational foundational hypothesis – support for human-animal

inequality was not a stronger predictor of support for the drug addict inequality than was support for the Bangladesh inequality. Similarly, support for human-animal inequality was not a stronger predictor of attitudes towards the Bangladesh inequality than was support for the drug addict inequality. As expected, feelings of coldness towards the target groups (e.g., drug addicts) were correlated with support for the associated inequality (e.g., the drug addict inequality).

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the drug addict and Bangladesh inequalities. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO, was more strongly correlated with attitudes towards the human groups. These correlational results provide further evidence that human-animal inequality is not asymmetrically correlated to human inequalities.

**5.4.2 Experimental results.** In study 1 we did not find any evidence for either of our first two experimental hypotheses. The results revealed that having participants write a short passage challenging human supremacy over animals, did not reduce the support for human-animal inequality relative to participants in the other two conditions. In addition, those same participants who completed a self-persuasion task challenging human supremacy did not show reduced support for human inequality (i.e., the drug addict, and Bangladesh inequalities). In other words, the human supremacy manipulation did not yield a reduction in support for human-animal inequality, and compared to the control condition, there was no reduction in support for human inequalities either. In short, we found no evidence for the experimental foundational hypothesis.

Turning to our other hypotheses surrounding human supremacy impacting on human-animal relations, we reasoned that if human-animal inequality is foundational to human inequalities, then challenging the notion of non-addict supremacy over drug addicts' should not have an impact on support for human-animal inequality. However, participants in the non-addicts supremacy condition should show lower levels of support for the drug addict

inequality compared to controls; we were unsure whether challenging non-addict supremacy would have an impact on attitudes towards the British-Bangladesh inequality. We also expected both human supremacy and non-addict supremacy conditions to produce similar levels of support for the drug addict inequality, and that both conditions would display less support for the drug addict inequality than controls.

We found mixed support for these hypotheses. The participants who wrote about non-addicts not being superior to drug addicts did show a reduction in support for the drug addict inequality compared to the two other conditions. However, we did not find that the non-addicts supremacy and human supremacy conditions displayed similar levels of support for the drug addict inequality. This finding shows the non-addict supremacy manipulation we developed was effective for reducing support for the drug addict inequality. We also found that challenging the notion of non-addict supremacy over drug addicts did not translate into a reduction of support for the human-animal or Bangladesh inequalities. This latter finding provides initial support that challenging human forms of supremacy (in this case of non-addict supremacy over drug addicts), does not have downstream effects on human-animal, or other human inequalities. These effects remained when analysing the data without vegetarians (and vegans) and ethnic minorities.

In looking at feelings of warmth, there was no difference in feelings of warmth towards animals between conditions. All participants showed high levels of warmth. Feelings of warmth towards Bangladesh workers were just below feelings of warmth towards animals and there was also no significant difference in feelings of warmth towards Bangladesh workers between conditions. There was a significant main effect of condition on feelings of warmth towards drug addicts, and this effect remained significant when controlling for SDO. Participants in the addicts' condition attributed significantly more warmth towards drug addicts than participants in the human supremacy condition, and marginally significantly more warmth than those in the control condition, however the mean of all conditions was below the mid-point of the scale. Importantly, our findings cannot be explained by vegetarians, vegans,

and ethnic minorities who might have more favourable attitudes towards animals and ethnic others, respectively.

Taking a step back from specific hypotheses and analyses, looking at the relation between support for the inequalities, and warmth towards the oppressed groups paints an interesting picture. The correlation between support for human-animal inequality, and warmth towards animals was much weaker than the correlations between either of human inequality and their corresponding measures of warmth. In addition, participants displayed the highest feelings of warmth towards animals, even though participants displayed the highest level of support for human-animal inequality. Participants displayed the highest level of warmth towards Bangladeshis, and the Bangladesh inequality was given the least support out of all measured inequalities. Participants displayed cold-neutral feelings towards drug addicts, even though they endorsed the drug addict inequality less than they did human-animal inequality. These findings reflect well the meat paradox – that people can both love and harm animals (Bastian & Loughnan, 2017). People can have positive feelings towards animals, all the while endorsing human-animal inequality.

**5.4.5 Qualitative results.** The result of study 1 that the human supremacy manipulation did not have an effect on support for human-animal or human inequalities was unexpected. We turned to a content analysis of participants' text this. We found three main topics (1) the notion of supremacy is arbitrary (2) negative human qualities, or (3) providing positive descriptions of animals.

Participants who wrote about the notion of supremacy being arbitrary tended to write about how fickle and ill-founded supremacist beliefs were, and how anthropocentric trying to claim that humans are superior to animals was. Only 5 participants approached the task in this way, and they gave quite convincing arguments. In retrospect, challenging the very idea of supremacy itself may be a decent way to reduce supremacist beliefs in more than one domain. The majority of participants wrote about negative human qualities (*N* = 55): how greedy and environmentally destructive humans can be, and

(some) people's desire to kill animals for the fun of it. It is possible that participants who write about negative human qualities were reinforcing their stereotypes and heuristics about vulnerable human groups (such as drug addicts, homeless people, and sweatshop workers from Bangladesh). Because most participants in the human supremacy condition chose to write about negative human qualities, the promotion of heuristic thinking towards outgroups could explain the lack of effects in study 1. The finding that participants mostly chose to write about the negative qualities of humans was unexpected, but noteworthy. In particular, the participants who wrote about negative human qualities provided stereotypical examples of prejudice towards outgroups such as drug addicts or sweatshop workers from Bangladesh – namely that they are useless humans, cannot look after themselves, or fend for themselves properly. While speculative, it may be that when those participants went on to answer the dependent measures about drug addicts and sweatshop workers from Bangladesh, they had a heightened sense of apathy for the very inequalities we were trying to reduce. In a similar vein, it might be that instead of the group-based supremacy manipulated in this thesis, future work could benefit from looking at challenging supremacy at the individual level. Such future work could explore whether challenging individual supremacy over animals (e.g., 'I am not superior to animals' as opposed to 'humans are not superior to animals'; and supremacy over individual animals as opposed to the group animals) could be a more efficient manipulation than the group-based manipulations presented. Such an exploration is, however, beyond the scope of this thesis.

The remaining participants ($N$ = 34) wrote about the positive aspects of animals, and they tended to focus on wild carnivorous animals and stress those animals' survival instincts. It is interesting to note that most participants did not give an example of a particular animal (e.g., cows or lions) and instead used the term 'animals' as instructed. No participants mentioned the animals that are commonly used for human consumption, (chickens, cows, pigs). We hired a research assistant to code each participant's response and we then looked for any differences in support for human-animal inequality based upon

the focus of their passage. We found that participants who wrote about the arbitrary nature of supremacy endorsed human-animal inequality less than participants who wrote about negative human qualities or positive animal qualities, however, the Bayesian results showed inconclusive evidence that there was a difference in support for human-animal inequality.

**5.4.6 Limitations of Study 1.** There are at least three limitations in study 1 that may have affected our findings. Firstly, as previously mentioned in the methods section, there was an error in the control condition manipulation. The condition stated both, that participants should write that "people who read books are not superior to people who watch TV", and (incorrectly) that "people who watch TV are not superior to people who read books". Although this typo is unfortunate, we ran a Bayesian t-test to see whether participants who followed one versus the other instructions scored any different on human-animal inequality measure, which revealed there was no difference. We then analysed all control participants together in subsequent analyses, and made sure there was no typos in future studies.

Second, we decided to measure support for the Bangladesh inequality after having conducted the pilot studies, and we therefore did not run a PCA before reducing the scale down to the 4 items that is was. However, the scale had good internal reliability, and a Principal Components Analysis revealed good support for the 4-item measure. Internal reliability analyses also provided additional support for the measure, as did correlations with the existing measures from pilot study 2.

Finally, in all our conditions (but particularly the human supremacy condition), we found that participants within conditions wrote about different things. For instance, some people in the human supremacy condition wrote about humans not being superior to animals, some people wrote about humans and animals being equal, and some people wrote that the notion of supremacy itself was arbitrary. We hired a research assistant to code the written response, and then ran within condition comparisons to test if there was any difference in the dependent measure of human-animal inequality based upon what the participants had chosen to write during the manipulation (in the

animal condition). We did not find any difference in the dependent measure. However, our qualitative approach to exploring the results of the first study was not as comprehensive as qualitative research can be.

As experimental psychologists, it is possible that we overlooked the value of a more thorough qualitative exploration of the data in study 1 because the exploration of the qualitative data was not pre-planned, and is not typical in the most relevant experimental psychology (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009). Indeed, the most relevant psychological research that has used similar written manipulations did not even report what participants wrote during their manipulation. Therefore, we believe that the post hoc qualitative exploration of the data from study 1 was sufficient for the purposes of this thesis. We also believe that future qualitative work could be employed to further examine the different ways in which people qualitatively conceptualize 'human supremacy' and how these conceptualizations could inform the experimental psychological work on human-animal relations.

**5.4.7 Conclusion.** There are two key findings from study 1 that surround the experimental and correlational findings. Firstly, challenging human supremacy does not necessarily translate to improved human attitudes. In study 1 using a sample with very strong power, and a diverse range of UK participants, we found no evidence for our foundational hypothesis. We did however, find strong correlational evidence corroborating the results from the pilot studies that the way participants thought about human-animal inequality is strongly – but not asymmetrically – related to how participants thought about human inequalities. To further explore whether the content which participants write about has an impact on the dependent variables and could therefore explain the inconclusive findings in study 1, we decided to run study 2 with variations of the human supremacy manipulation, based off the qualitative results of study 1.

# Chapter Six: Developing the Qualitative Framing of the Manipulations

## 6.1 Introduction

In study 1, we developed a novel manipulation which challenged notions of supremacy (e.g., human supremacy over animals, or non-addict supremacy over drug addicts), and we then tested our experimental foundational hypotheses, on the support for various (human-animal and human) inequalities. We reasoned that if human-animal inequality was foundational to human inequalities, then challenging human supremacy should reduce support for both human-animal and human forms of inequality. However, if human-animal inequality is foundational to human forms of inequality, then challenging non-addict supremacy over drug addicts should only reduce support for human *but not* human-animal inequalities. We found that having participants write a short passage challenging human supremacy over animals did not reduce the support for human-animal inequality relative to participants in the other two conditions (participants who challenged either non-addict supremacy over drug addicts, or a control). In addition, those same participants who challenged human supremacy did not show reduced support for human inequality (i.e., the drug addict, and Bangladesh inequalities). In short, we found no evidence for the experimental foundational hypothesis.

To begin to explore why this might be, we then turned to a content analysis of what the participants wrote about in the human supremacy condition. We found that there was variance in what participants chose to write about and so we hypothesized that the differences in the content of the written response could explain the results. That is, we thought that the manner in which participants challenged human supremacy could have an impact on the dependent measures. We found that the three main topics participants wrote about were (1) the notion of supremacy is arbitrary (2) negative human qualities, or (3) positive animal qualities. We found that participants who wrote about the arbitrary nature of supremacy endorsed human-animal inequality less than participants who wrote about negative human qualities or positive

animal qualities, however, the Bayesian results showed inconclusive evidence that the differences were statistically meaningful.

We thought that because of the variation in the qualitative results of the self-persuasion task in study 1 in the human supremacy condition, it may be that challenging a specific component of human supremacy over animals may be a more effective way to reduce support for human-animal and human inequalities. We hypothesize that challenging human supremacy by framing the manipulation towards the arbitrary nature of 'human supremacy' will provide the largest decrease in the dependent measures, compared to other conditions. This is because challenging human supremacy by writing about the arbitrary nature of supremacy could lead to participants to think more openly and reduce reliance on heuristic and stereotypical thinking (Crisp & Turner, 2010). That is, by challenging the stereotypical thinking associated with human supremacy, this might translate into reduced stereotypical thinking towards both human-animal inequality, and human inequalities more generally (Crisp & Turner, 2010).

We hypothesize that challenging human supremacy by framing the manipulation towards thinking and writing about humans' downfalls could reduce support for human-animal inequality, but strengthen support for human inequalities. This is because reminders of some of the negative things that humans do could challenge the idea that humans are superior to animals and it could also perpetuate outgroup stereotypes and lead to support for human inequalities

Alternatively, challenging human supremacy by thinking and writing about the positive aspects of animals may reduce support for human-animal inequality and possibly a reduction in support for human inequalities. This is because thinking about animals in a favourable light (e.g. being warm and competent) may challenge the indifference associated with human-animal inequality resulting in reduced support for human-animal inequality. However, thinking more positively about animals may not necessarily translate into reduced endorsement of human inequalities because of the separation between feelings (e.g., of warmth towards a group) and attitudes (e.g., towards

the inequality that group experiences). The purpose of study 2 is to examine whether the framing of the human supremacy manipulation has an impact on the support for human-animal and humans inequalities. Similar to study 1, we had both correlational and experimental hypotheses.

**6.1.1 Correlational hypotheses.** We hypothesized that attitudes towards the human-animals, drug addict, and Bangladesh inequalities would all be positively correlated. That is, people who support one inequality are likely to support other inequalities (Costello & Hodson, 2014). We did not expect that support for human-animal inequality would be asymmetrically correlated to support for human inequalities, as per the results of the pilot studies, and study 1.

**6.1.2 Experimental hypotheses.** We predicted that participants who challenge human supremacy over animals by writing that human supremacy is arbitrary would show reduced support for human-animal inequality (compared to those who wrote about positive animal qualities or negative human qualities). In addition, we expected that participants in the arbitrary condition to show reduced support for human inequality (drug addict and Bangladesh inequalities). We did not have specific hypotheses about whether the positive animal qualities condition and the negative human qualities condition would be different, as previous research supports different hypotheses as outlined in the introduction to this chapter (Brewer, 1999; Leidner, Castano, Zaiser, & Giner-Sorolla, 2010).

## 6.2 Method

**6.2.1 Participants.** Similar to study 1, we wanted to include a sample of participants diverse in age and political orientation (Henrich, Heine, & Norenzayan, 2010), and so purposefully recruited adult UK participants from across the political spectrum, and a large variety of ages. We were able to do this using the same online recruitment website Prolific Academic as we used for study 1 in the previous chapter. Sample size was determined a priori using g*power software. Using $\alpha = .05$; power = .80; and $f = 0.25$ for an ANCOVA with 3 conditions suggested 158 participants (Faul, Erdfelder, Buchner, & Lang, 2009).

One hundred and fifty two participants completed the study (63 Male; Mean age 40.65 years, SD = 12.98) and were paid £1 and spent on average 9 minutes and 15 seconds (SD = 3 minutes and 57 seconds) to complete the study. The minimum time it took participants to complete the survey was 3 minutes and 20 seconds, and the maximum time was 27 minutes and 57 seconds. In terms of ethnicity, 140 participants self-identified as White European, 3 as Black/ African, 1 as East Asian, 2 as Indian, 4 as multiracial, and 2 as 'other'. Regarding citizenship, 145 participants self-identified as UK citizens, 2 participants were UK permanent residents and 5 participants did not answer this question. In terms of diet, 64 participants said they were meat eaters, 52 omnivore, 17 had limited meat intake (ate no red meat, or only fish or chicken), 17 were vegetarian, and 2 were vegan. Participants consented to the study by clicking on the next page button on their computer. Participants completed the study in their own time, and on an internet enabled device of their choice (e.g., cell phone, tablet, desktop computer).

**6.2.2 Design.** The entire study was completed online. Participants were given informed consent and then randomly assigned to one of three conditions. All participants completed one of three writing tasks, and were then given the dependent measures. Participants were then debriefed and paid.

**6.2.3 Manipulations.** Participants were randomly assigned to write about one of the three topics. All topics involved challenging the idea of human supremacy over animals, and were comprised from the qualitative results in study 1. In all conditions, participants were instructed to imagine they had to convince a friend that humans are not 'superior' to animals. Participants then received one of three different suggestions (human supremacy is arbitrary vs negative human qualities vs positive animal qualities). Participants in all three conditions were then instructed to take 2 or 3 minutes to write about how humans are not superior to animals.

***Human supremacy is arbitrary.*** Participants in the human supremacy is arbitrary condition were asked to challenge human supremacy, and were given as their writing example the following prompt derived from the qualitative results of study 1 in the previous chapter:

“Some people say that humans are 'superior' to animals because we are more 'intelligent' or 'sophisticated' than other animals. Because of this, we say humans should not be harmed, but it is okay to harm animals. However, humans choose 'what it means to be superior' based on something we know we are good at (e.g., intelligence). But why should 'intelligence' and 'sophistication' be the criteria for whether a species is superior? If we chose an attribute besides intelligence or sophistication then humans are no longer superior. For example, if we used survivability rather than intelligence, then cockroaches would be superior to humans. Also, if we chose an attribute such as living a long life, then whales and tortoises would be superior to humans (both can live up to 200 years). We decided that we are 'superior' to animals, but we have also decided what it means to be superior.”

***Negative human qualities.*** The next manipulation was designed to have participants write about the bad things that humans can do, as an example of why humans are not superior to animals. We chose to focus just on the harmful, cruel dimension of bad human behaviour (and leave out ideas about humans being unable to survive in the wild etc.), to distinguish between the other two conditions (particularly the ‘animals are good condition’). Participants in this condition were given this writing suggestion:

“There are many bad things humans do. For example, humans are very good at being cruel and hurting other people, and some people kill animals unnecessarily. People can also be greedy and live such wasteful lives and this is having a massive impact on the environment.”

***Positive animal qualities.*** Participants in the ‘positive animal qualities’ condition were instructed to challenge the notion of human supremacy by writing about some of the positive aspects of animals’ life. Participants in this condition were given the following as writing suggestions:

“Animals love playing! Baby goats’ jump all over each other, little piglets run around together and small puppies play together. Some animals stay together for their whole life and appear to be in love. Many animals help each other and care for their family members, and members of other species, sometimes cleaning and grooming each other.”

### 6.2.4 Measures.

The measures were identical to Study 1.

## 6.3 Results

**6.3.1 Analysis strategy.** We employed both frequentist (using SPSS software) and Bayesian analyses (using JASP software), and ran different models with and without SDO as a covariate. We also ran our main analyses with and without the ethnic minorities and vegetarians/vegans; we obtained the same results (with one exception – see end of Results section) when excluding vegetarians, and so only report the analyses including all participants.

**6.3.2 Preliminary data treatment.** One hundred and sixty six participants were originally recruited, however, fourteen people did not complete the study and these people were removed from analysis, leaving our final sample of 152. Before analysing the data, we looked at the qualitative response participants wrote. This showed that no participants wrote against the argument (i.e., that humans *are* superior to animals), therefore all participants were included in the analyses.

**6.3.3 Missing data.** Forty-seven participants had missing data; most of these were just missing an answer to one or two questions in the dependent measures. The missing data was replaced with the mean of the scale (50) as in the previous study.

**6.3.4 Correlational results.** Please see Table 6.1 below for correlations between all variables in study 2 with correlations, frequentist p-values, and Bayes factors. Overall, the correlational results from Study 2 replicate the correlational results from Study 1. That is, supporting our correlational hypotheses, the attitudes towards all three inequalities (human-animal, drug addict, and Bangladesh) were all positively correlated.

Table 6.1. Showing Pearson correlations, frequentist p-values, and Bayes factors between all variables in study 2.

| Variable | | 1. Human-animal | 2.Drug addict | 3. Bangladesh | 4. SDO | 5. PO | 6. Animal warmth | 7. Addicts warmth | 8. Workers warmth |
|---|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.38 | | | | | | | |
| | p | < .001 | | | | | | | |
| | $BF_{10}$ | 7.92e+3 | | | | | | | |
| 3 | r | 0.44 | 0.47 | | | | | | |
| | p | < .001 | < .001 | | | | | | |
| | $BF_{10}$ | 8.84e+5 | 5.76e+6 | | | | | | |
| 4 | r | 0.30 | 0.50 | 0.54 | | | | | |
| | p | < .001 | < .001 | < .001 | | | | | |
| | $BF_{10}$ | 196.08 | 1.70e+8 | 1.58e+10 | | | | | |
| 5 | r | 0.18 | 0.33 | 0.38 | 0.37 | | | | |
| | p | .014 | < .001 | < .001 | < .001 | | | | |
| | $BF_{10}$ | 2.25 | 593.56 | 2.18e+4 | 1.23e+4 | | | | |
| 6 | r | -0.51 | -0.15 | -0.28 | -0.16 | -0.02 | | | |
| | p | < .001 | .033 | < .001 | .025 | .400 | | | |
| | $BF_{10}$ | 3.15e+8 | 1.07 | 79.12 | 1.30 | 0.13 | | | |
| 7 | r | -0.08 | -0.47 | -0.21 | -0.24 | -0.40 | 0.10 | | |
| | p | .157 | < .001 | .005 | .002 | < .001 | .119 | | |
| | $BF_{10}$ | 0.29 | 1.04e+7 | 5.83 | 13.99 | 1.00e+5 | 0.05 | | |
| 8 | r | -0.04 | -0.23 | -0.39 | -0.22 | -0.16 | 0.12 | 0.27 | - |
| | p | .311 | .003 | < .001 | .004 | .027 | .070 | < .001 | - |
| | $BF_{10}$ | 0.16 | 7.89 | 2.87e+4 | 6.68 | 1.25 | 0.04 | 0.02 | |

Note: r = Pearson correlation; p = p-value; $BF_{10}$ = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh = inequalities; Workers warmth = warmth towards Bangladesh sweatshop workers.

In addition, attitudes towards animals were again not more strongly correlated with the human target groups than the other human group, and vice versa. These correlational results provide further evidence that human-animal inequality is not asymmetrically correlated to human inequalities.

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the drug addict and Bangladesh inequalities. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO, was more strongly correlated with attitudes towards the human inequalities.

When looking at warmth, feelings of warmth towards animals was negatively correlated with support for human-animal inequality, but was not correlated with attitudes towards human inequalities. Warmth towards animals was also not correlated with warmth towards drug addicts or towards Bangladesh workers. Warmth towards drug addicts was strongly negatively correlated with support for the drug addict inequality, and so too was warmth towards Bangladesh workers and support for the Bangladesh inequality. Feelings of warmth towards drug addicts were also positively correlated with warmth towards Bangladesh workers.

It is interesting to note that feelings of warmth and support for the inequality correlate highly for both human-animal and the drug addict inequality, whereas warmth and support for the Bangladesh inequality was moderately correlated. This is interesting because most people in the study likely contribute to the inequality of Bangladesh people (via their consumption of sweatshop clothing from Bangladesh), more directly than they do contribute to oppressing drug addicts. From the correlational results, participants feelings of warmth (or coldness) towards drug addicts and animals are more aligned with participants support for the inequalities. Whereas for the Bangladesh inequality, the weaker relationship between endorsing the inequality and feelings of warmth, suggest that participants' feelings of warmth and acceptance of inequality are not as tightly aligned as they are for drug addicts and animals in this sample. This discrepancy between feelings of warmth and

support for the Bangladesh inequality is consistent with research on the consumption of morally troublesome goods (Bastian & Loughnan, 2017).

### 6.3.5 Experimental Results

***Human-animal inequality.*** To examine whether there were differences in participant's endorsement of human-animal inequality, we conducted a one-way analysis of variance (ANOVA), with condition as a between subjects factor, and support for human-animal inequality as the dependent variable. We ran our ANOVA with and without SDO as a covariate, to control for individual differences in SDO. See Figure 6.1 below for the mean level of support for human-animal inequality.

Contrary to the hypothesis, the ANOVA revealed no significant difference in the endorsement of human-animal inequality between conditions, $F(2, 142) = 0.56$, $p = 0.572$, $\eta_p^2 = 0.00$, $BF_M = 0.00$. That is, both the positive animal qualities ($M = 32.99$, $SD = 18.77$) and negative human qualities ($M = 31.85$, $SD = 21.76$) showed slightly, but not significantly less endorsement of human-animal inequality, than the arbitrary condition ($M = 36.05$, $SD = 19.84$). Levene's test for equality of variance was not violated, $F(2, 142) = 0.42$, $p = .656$. When including SDO in the model, SDO was a significant covariate, $F(1, 141) = 14.24$, $p < .001$, $\eta_p^2 = 0.09$, $BF_M = 26.88$, and the overall model remained non-significant, $F(2, 141) = 0.49$, $p = .613$, $\eta_p^2 = 0.01$, $BF_M = 0.30$.

Bayesian model comparison results showed good support for SDO predicting support for human-animal inequality, inconclusive evidence that condition and SDO together predicted support for human-animal inequality, and weak evidence for a main effect of condition. Bayesian model comparison also revealed inconclusive evidence for the null model, $BF_M = 0.02$. To sum, Bayesian model comparison revealed that individual differences in SDO best predicted support for human-animal inequality, and there was inconclusive evidence that our manipulation had an effect on support for human-animal inequality.

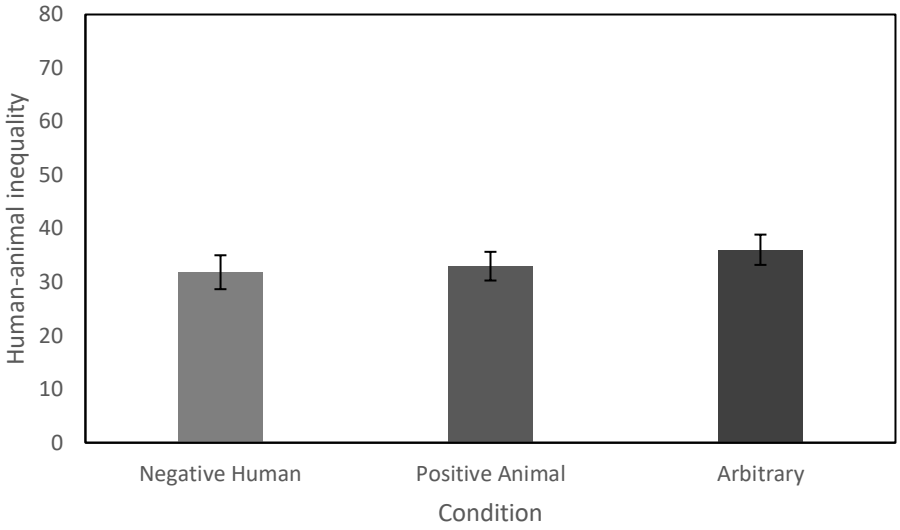


*Figure 6.1.* Showing no difference in the mean level of support for human-animal inequality per condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards animals.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards animals. See Figure 6.2 below for the mean feelings of warmth towards animals per condition. Levene's test for equality of variance was violated, $F(2, 149) = 3.81$, $p = .024$. The results, with Welch correction for heterogonous variance, revealed a significant difference in feelings of warmth towards animals between conditions, $F(2, 94.41) = 3.56$, $p = .032$, $\eta_p^2 = 0.04$, $BF_M = 0.74$. Participants in the positive animal qualities ($M = 88.22$, $SD = 12.57$), displayed more warmth towards animals than participants in both the negative human qualities condition ($M = 82.80$, $SD = 20.02$) and the arbitrary conditions ($M = 79.86$, $SD = 20.23$). When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 148) = 4.17$, $p = .043$, $\eta_p^2 = .03$, $BF_M = 1.23$, and the model remained marginally significant, $F(2, 148) = 2.96$, $p = 0.055$, $\eta_p^2 = .04$, $BF_M = 0.88$. Further, Bayesian model comparison showed inconclusive evidence for the null model, $BF_M = 1.19$, suggesting we cannot rule out there is no effect of condition. Together, Bayesian model comparison suggests that the evidence for the effect of condition on warmth towards animals is inconclusive even when controlling for SDO, suggesting caution should be taken when interpreting the significant frequentist findings.

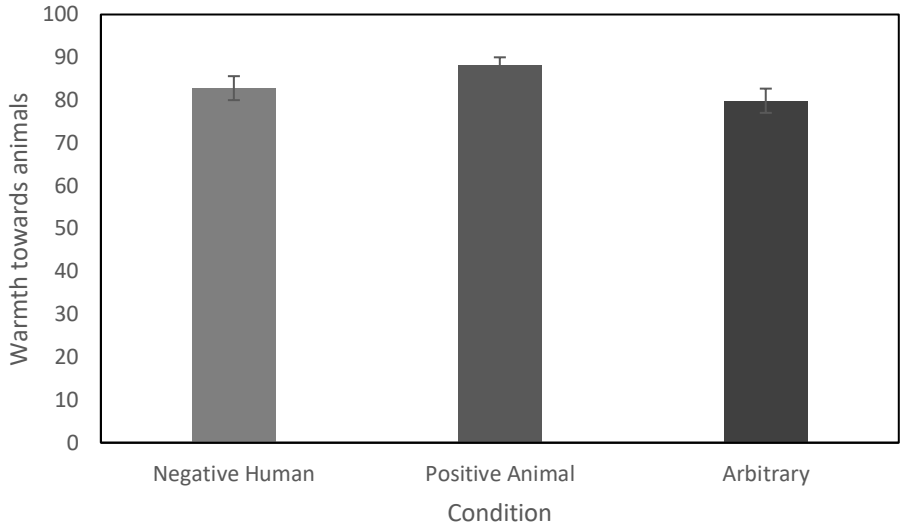


*Figure 6.2.* Showing no difference in the mean feelings of warmth towards animals per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error of the mean.

***Drug addict inequality.*** To examine whether there were differences in participant's endorsement of the drug addict inequality , we conducted a one way analysis of variance (ANOVA), with condition as a between subjects factor. Again, we ran our ANOVA with and without SDO as a covariate, to see whether partially out individual differences in SDO changed the results of the ANOVA. See Figure 6.3 below for the mean level of support for the drug addict inequality per condition.

The ANOVA revealed there was no significant difference in the endorsement of the drug addict inequality between conditions, $F(2, 141) = 0.51$, $p = .601$, $\eta_p^2 = 0.01$, $BF_M = 4.47e\text{-}9$. The positive animals qualities ($M = 23.35$, $SD = 17.99$) did not show significantly less endorsement of the drug addict inequality than the negative human qualities ($M = 29.10$, $SD = 20.02$) or arbitrary condition ($M = 33.05$, $SD = 22.70$). Levene's test for equality of variance was not violated, $F(2, 141) = 1.23$, $p = .287$. When including SDO in the model, SDO was a significant covariate, $F(1, 140) = 46.95$, $p < .001$, $\eta_p^2 = 0.25$, $BF_M = 36.27$, and the overall model remained non-significant, $F(2, 140) = 0.24$, $p = .788$, $\eta_p^2 < 0.01$, $BF_M = 025$.

Bayesian model comparison showed strong support that SDO alone best explained the variance in attitudes towards the drug addict inequality, and

weak evidence for SDO and condition predicting attitudes towards the drug addict inequality. In addition, Bayesian model comparison revealed very strong evidence against the null model, $BF_M$ = 4.20e -8. Taken together, these results suggest that the type of manipulation had no impact on endorsing the drug addict inequality, even when controlling for individual differences in SDO.

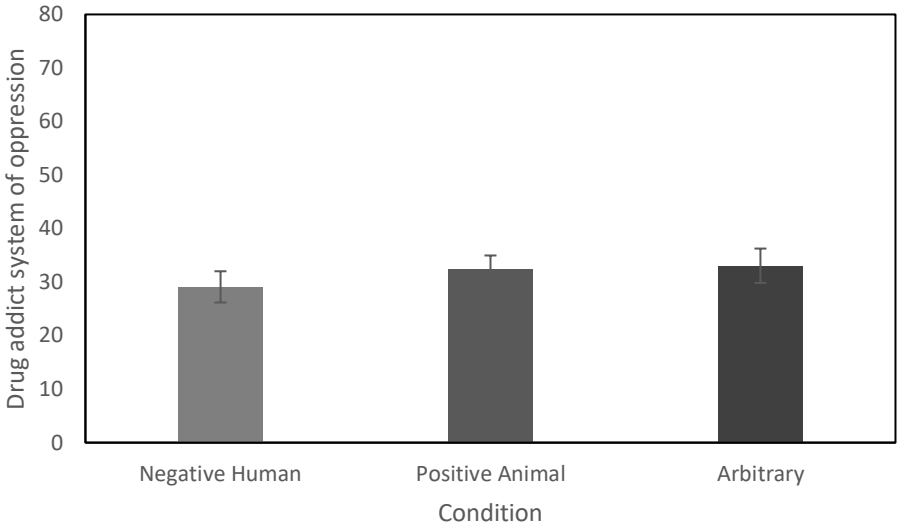


*Figure 6.3.* Showing no difference in the mean level of support for the drug addict inequality per condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards drug addicts.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards drug addicts. See Figure 6.4 below for the mean feelings of warmth towards drug addicts per condition. The results revealed no significant difference in feelings of warmth towards drug addicts between conditions, $F(2, 149) = 0.15$, $p = .865$, $\eta_p^2 < 0.01$, $BF_M = 0.02$. Participants in the positive animals qualities ($M = 42.20$, $SD = 22.50$), negative human qualities ($M = 41.98$, $SD = 28.42$), and the arbitrary condition ($M = 44.43$, $SD = 24.87$) displayed low levels of warmth towards drug addicts. Levene's test for equality of variance was not violated, $F(2, 149) = 2.63$, $p = .076$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 148) = 8.93$, $p = 0.003$, $\eta_p^2 = 0.06$, $BF_M = 15.70$, and the overall model remained non-significant, $F(2, 148) = 0.244$, $p = .784$, $\eta_p^2 < 0.01$, $BF_M = 0.21$. There was also inconclusive evidence for the null model, $BF_M = 0.29$. In short, individual differences in SDO predicted warmth towards

drug addicts, and there is inconclusive evidence that condition had any additional effect.

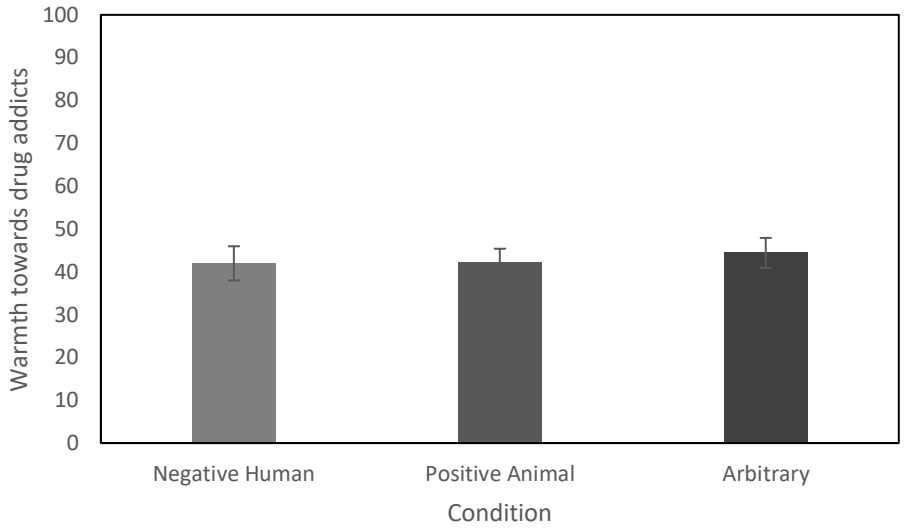


*Figure 6.4.* Showing no difference in the mean feelings of warmth towards drug addicts per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Bangladesh inequality.*** To examine whether there were differences in participant's endorsement of the Bangladesh inequality, we conducted a one-way ANOVA, with condition as a between subjects factor. See figure 6.5 below for the mean level of support for the Bangladesh inequality per condition. Again, we ran our ANOVA with and without SDO as a covariate, to see whether partially out individual differences in SDO changed the results of the ANOVA.

In contrast with our hypothesis, the ANOVA revealed no significant difference in the endorsement of the Bangladesh inequality between conditions, $F(2, 147) = 0.50$, $p = .609$, $\eta_p^2 = 0.01$, $BF_M = 4.62e\text{-}11$. The positive animal qualities ($M = 17.12$, $SD = 14.81$), the negative human qualities ($M = 18.61$, $SD = 16.70$) and the arbitrary condition ($M = 20.42$, $SD = 17.95$) all showed low support for the Bangladesh inequality. Levene's test for equality of variance was not violated, $F(2, 147) = 2.27$, $p = .107$. When including SDO in the model, SDO was a significant covariate, $F(1, 146) = 60.85$, $p < .001$, $\eta_p^2 = 0.29$, $BF_M = 21.77$, and the overall model remained non-significant, $F(2, 146) = 0.87$, $p = .420$, $\eta_p^2 = 0.01$, $BF_M = 0.41$. Bayesian model comparison also revealed very strong evidence against the null model, $BF_M = 4.60e\text{-}10$. Taken

together, Bayesian model comparison revealed there was inconclusive evidence that there was an effect of condition on the dependent variable, and good evidence that SDO alone best predicted support for the Bangladesh inequality.

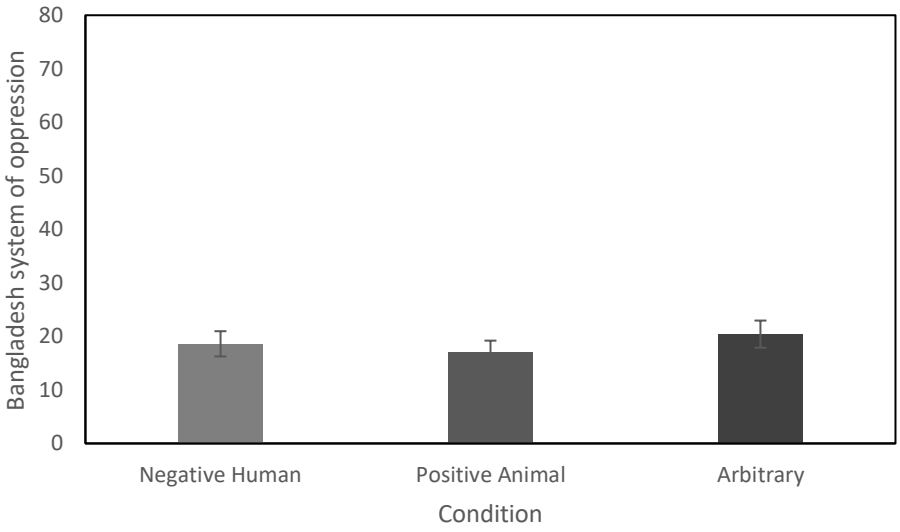


*Figure 6.5.* Showing no difference in the mean level of support for the Bangladesh inequality per condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards Bangladesh workers.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards Bangladesh workers. See Figure 6.6 below for the mean feelings of warmth towards Bangladeshi workers per condition. The results revealed no significant difference in feelings of warmth towards Bangladesh workers between conditions, $F(2, 149) = .41$, $p = .663$, $\eta_p^2 = 0.01$, $BF_M = 0.05$. Participants in the positive animal qualities ($M = 71.60$, $SD = 18.58$), the negative human qualities ($M = 71.02$, $SD = 21.10$), and arbitrary conditions ($M = 68.14$, $SD = 21.83$), all showed high levels of warmth towards Bangladesh sweatshop workers. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 148) = 7.13$, $p = .008$, $\eta_p^2 = 0.05$, $BF_M = 9.29$, however, the overall model remained non-significant, $F(2, 148) = 0.39$ $p = .675$, $\eta_p^2 = 0.01$, $BF_M = 0.22$. Bayesian model comparison also revealed inconclusive evidence for or against the null model, $BF_M = 0.58$. That is, similar to attitudes supremacy over Bangladesh workers, Bayesian model comparison revealed there was

inconclusive evidence that condition had an effect, and good evidence that SDO alone best predicted warmth towards Bangladesh workers.

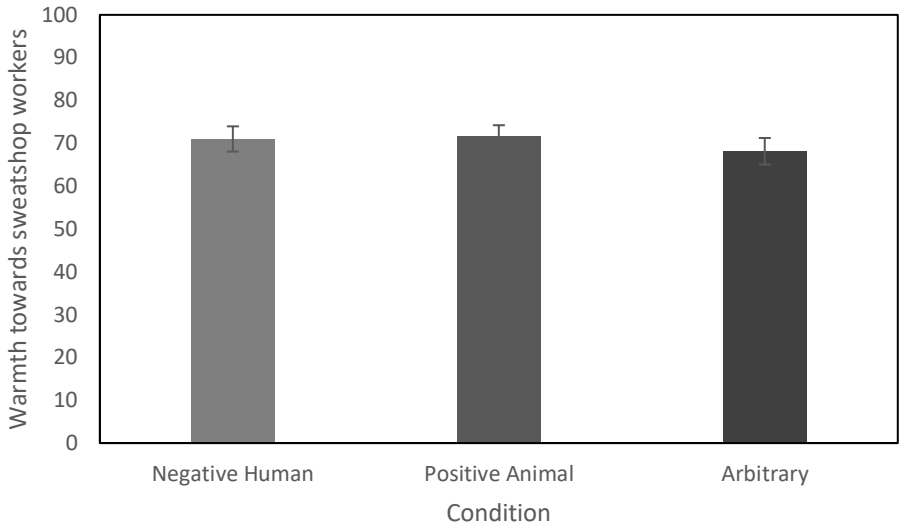


*Figure 6.6.* Showing no difference in the mean feelings of warmth towards Bangladesh workers per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Post hoc analyses excluding vegetarians and ethnic minorities.*** Finally, similar to study 1, we next removed the 12 ethnic minorities, 17 vegetarians and 2 vegans and re ran the Bayesian analyses. There was no difference in any of the results, with the exception that SDO as a covariate in predicting warmth towards animals improved from $BF_M = 1.23$ to $BF_M = 4.47$.

## 6.4 Discussion

**6.4.1 Correlational Results.** We found that support for human-animal and human inequalities were all correlated with each other. We also found that support for human-animal inequality was not a stronger predictor of support for human- human inequalities (e.g., drug addicts) than was the other human inequality (e.g., workers from Bangladesh). Both of these findings are consistent with the results of the pilot studies and study 1. In addition, these correlational results add to the literature on human-animal relations by showing that people's attitudes towards human inequalities, such as towards drug addicts and towards the exploitation of developing world labour is consistently associated with attitudes towards human-animal inequality.

In addition, SDO was more strongly correlated with the Bangladesh and drug addict inequalities than with attitudes towards human-animal inequality.

This finding is also consistent with the pilot studies and study 1. This finding could be the result of participants at all levels of SDO openly supporting human-animal inequality, yet when it comes to human inequalities, low SDO people are more likely to report that human inequality are not okay, even if the participants support those inequalities (e.g., by purchasing sweatshop clothes).

Taking the frequentist and Bayesian correlational results together, there was inconclusive evidence that political orientation was related to endorsement of human-animal inequality or warmth towards animals, suggesting that, overall people all along the political spectrum are neutral about human-animal inequality. However, these same people all have warm attitudes towards animals. These effects are consistent with work on the meat paradox: people both like animals and like exploiting animals (Bastian & Loughnan, 2017). Interestingly, political orientation was strongly correlated with endorsing supremacy over both our human outgroups. Right wing political orientation was positively associated with endorsing the drug addict inequality, and an even stronger predictor of endorsing the Bangladesh inequality.

These findings show overall consistency with study 1. For instance, study 1 found moderate evidence that conservative political orientation predicted support for human-animal inequality. In addition, conservative political orientation was associated very highly with support for both human inequality. However, both studies revealed that both SDO and conservative political orientation predicted human inequalities far more strongly than they predicted human-animal inequality.

Like previous research, SDO and political orientation in this study were significantly positively correlated. However, political conservatism was a very strong predictor of cold feelings towards drug addicts, but there was no good evidence that political conservatism was related to feelings towards animals or Bangladesh sweatshop workers. In line with study 1, feelings of warmth towards animals were also unrelated to feelings of warmth towards both human groups. Again, in line with study 1, only feelings of warmth towards drug addicts and Bangladesh sweatshop workers were correlated.

**6.4.2 Experimental results.** We found no support for our experimental hypotheses; we found no main effect of condition on our dependent variables. This was an unexpected finding as we had hypothesized that the focus of supremacy being arbitrary would have an impact on the dependent variables. Instead, we found that all participants slightly disagreed with the endorsement of human-animal inequality (all conditions scored just below the mean of the scale), and had high levels of warm feelings towards animals (all conditions near the high end of the scale), and that individual differences in SDO best predicted their support for all inequalities. In other words, on average, participants (including meat eaters when analysed separately) opposed human-animal inequality and had positive feelings towards animals, even though those same participants are complicit in harming animals indirectly via their consumption of animal products.

All participants showed a similar level of disagreement with the drug addict inequality (all conditions scored around the bottom third of the scale). However, unlike human-animal inequality, low support for the drug addict inequality was accompanied by relatively cold feelings towards drug addicts (all conditions below the midpoint of the scale). That is, overall, participants did not endorse the drug addict inequality but they had neutral feelings towards drug addicts. This suggests that participants see drug addicts as a cold group, and is consistent with research on the dehumanization and stereotyping of drug addicts (Harris & Fiske, 2006).

The pattern of participant's attitudes and feelings towards Bangladesh workers, more so reflects attitudes and feelings towards animals than towards drug addicts. That is, participants showed a very low level of support for the Bangladesh inequality (the lowest of all three inequalities), and very warm feelings towards sweatshop workers, even though our participants highly likely consume sweatshop clothes. Interestingly, the two inequalities that participants are more directly involved in (human-animal, and Bangladesh), were afforded the warmest feelings. This finding is consistent with research showing morally troublesome behaviour often occurs in the face of positive

attitudes towards the group one is exploiting (e.g., animals, or sweatshop workers in Bangladesh) (Bastian & Loughnan, 2017).

Indeed, because of the way society functions, participants may not be aware of the consequences of their behaviour, and so do not feel dissonance from caring about animals and Bangladesh workers, while consuming products which necessitate the exploitation of those two groups. Study 1 and study 2 both reveal that participants can have positive feelings for, and exploit others.

In addition, it is also possible that participants can advocate against inequalities, all the while their behaviour supports those systems. Indeed, it is important to note that the effects observed in this study held even when excluding all vegetarians from analyses. In particular, meat eaters rejected human-animal inequality to the same degree as vegetarians, even though they regularly eat animal products. This finding is consistent with research suggesting that people are often unaware of the reality of their consumer behaviour (e.g., the reality of the meat industry), and therefore do not feel dissonance from caring about animals and wanting to eat them (Bastian & Loughnan, 2017).

The same psychological mechanisms may also be at play with respect to Bangladesh sweatshop workers, although it is unclear to what extent our participants are aware of the sweatshop industry and their participation in it. It may be that participants have a distorted view of the consequences of their consumer behaviour on Bangladesh workers; such a finding would be interesting, but is beyond the scope of this research.

**6.4.3 Limitations of Study 2.** The main limitation of study 2 is the focus on refining the human supremacy manipulation and no other manipulation. We chose to only examine whether framing the human supremacy manipulation differently had an impact on the results, and we did not examine whether framing the drug addicts' manipulation differently might also have an impact on the results. We did not do this because in study 1 we found that the non-addict supremacy manipulation successfully changed participants support for the drug addicts supremacy (compared to other conditions), whereas the human supremacy manipulation did not (relative to other conditions) have an

impact on support for human-animal inequality. Therefore, we wanted in study 2 to examine whether we could refine the human supremacy manipulation. It could be that refinement of both the non-addicts supremacy manipulation and the control manipulation could also led to an improvement in the effect on the dependent variables, however, due to resource constraints such further refinement was beyond the scope of this thesis. We believe that doing so could be an avenue for future research.

**6.4.4 Conclusion.** There is one key takeaway from study 2: we did not find any evidence that could explain the null results of study 1. We explored three qualitatively different ways of framing the human supremacy manipulation in study 2, and found the difference in manipulations had no effect on any of the dependent measures. After finding out that the wording of the animal manipulations could not explain the results of study 1, we sought to replicate study 1, in a different sample. The most relevant previous research has used undergraduate psychology students, whereas this thesis has so far drawn from a UK wide adult population. For example, the two previous studies which have manipulated attitudes towards human-animal relations (i.e., manipulated the human-animal divide) and measured the impact on human outgroups (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009) both employed undergraduate psychology students from a Canadian University in their sample. Moreover, the research conducted by Bastian, Costello, Loughnan, and Hodson (2012; study 3) had a mean age of 19 years, and was 82% female. Furthermore, the research conducted by Costello and Hodson (2009) also had a mean age of 19 years old and similarly was comprised of 75% female participants.

The relevant experimental research measuring the impact of human-animal attitudes on outgroup attitudes has not been published using a sample as diverse as this thesis used. That is, the pilot studies, and study 1 and 2 were conducted using a UK wide participant pool, and employed people of a wide age range and included people across the political spectrum. Because of the research identifying concerns with using niche samples such as undergraduate psychology students in Western developed nations (Henrich,

Heine, & Norenzayan, 2010), it is possible that the lack of support for our hypotheses are due to the sample we have used. Therefore, we decided our third study would examine our foundational hypotheses using a similar sample to previous literature on human-animal relations that has found significant results, by employing undergraduate psychology students at the University of Edinburgh.

# Chapter Seven: Returning to the foundational hypothesis

## 7.1 Introduction

In chapter 6, we presented study 2 that revealed that framing the human supremacy manipulation in different ways did not have an impact on participants' support for human-animal or human inequalities. We concluded study 2 by discussing the differences in participant sample between the most relevant research on human-animal relations (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009) and the current work. Study 3 examines our experimental foundational hypothesis using a sample of undergraduate psychology students. Doing so would reveal whether the findings in study 1 were due to the experimental foundational hypothesis being false; methodological flaws in the manipulations and measures; or due to differences in the participants used. In study 3, we utilized the undergraduate participant pool in psychology to run our study. In addition, we also included a fourth experimental condition, and a fourth 'inequality' dependent variable.

We explain the rationale for these two additions here, beginning with the new condition. Recall that study 1 revealed that participants in the human supremacy tended to write one of three variations about humans not being superior to animals. Also, recall that in study 2 we did not find any differences in the dependent variables based upon what participants wrote about. Therefore, the first addition to study 1 was to include two versions of the human supremacy manipulation in this study – alongside the same non-addict supremacy manipulation and the control manipulation – to see if we could replicate study 2.

The second addition to study 1 was to include a third human inequality in the measures of this study. We decided to include a measure of support for the homeless inequality, because homeless people are another vulnerable group in UK society which are dehumanized and neglected by society (Fiske, Cuddy, Glick, & Xu, 2002; Harris & Fiske, 2006). In addition, the pilot studies revealed that the homeless inequality was human inequality supported the most, second only to the drug addict inequality. We acknowledge that homeless people are not persecuted in the same way that drug addicts are, or

harmed in the way that animals are. However, homeless people share a similar personal profile to drug addicts and therefore represent a vulnerable population in society, which are beyond the realm of moral concern for most (Harris & Fiske, 2006). Similar to the previous two chapters, we had both correlational and experimental hypotheses.

**7.1.1 Correlational hypotheses.** We hypothesized that attitudes towards the human-animals, drug addict, Bangladesh, and homeless inequalities would all be positively correlated. That is, people who support one inequality are likely to support other inequalities (Costello & Hodson, 2014). We did not expect that support for human-animal inequality would be asymmetrically correlated to support for human inequalities, as per the results of the pilot studies, and studies 1 and 2.

**7.1.2 Experimental hypotheses.** We had evidence to support two foundational hypotheses. On the one hand, we expected to replicate the null effect of study 1 that there would be no difference in the dependent variables by condition. However, on the other hand we predicted that using undergraduate psychology students as participants would show support for the foundational hypothesis. We thought this would be the case because the most relevant research which has manipulated human-animal relations and measured attitudes towards humans has only been published with psychology undergraduate students (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009). If we did find a difference between conditions on the dependent measures, we expected the 'human supremacy is arbitrary' to show the least support for human-animal and human inequalities, based off the qualitative responses of study 1 and the results of previous work (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009).

## 7.2 Method

**7.2.1 Participants.** We wanted to include a sample similar to previous work on human-animal relations (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009), and so recruited undergraduate psychology students from the University of Edinburgh. The participants were similar age and gender composition to previous work (Bastian, Costello, Loughnan, &

Hodson, 2012; Costello & Hodson, 2009). Sample size was determined a priori using g*power software. Using α = .05; power = .80; and f = 0.25 for an ANCOVA with four conditions suggested 179 participants (Faul, Erdfelder, Buchner, & Lang, 2009).

The participants were 205 first year undergraduate psychology students (Mean age = 19.88, SD =14.39; 152 women, 51 men, 2 missing cases) from the University of Edinburgh. Participants completed the study in exchange for 0.5 course credit. Three participants took over 3 hours to complete the study, possibly because they started the study, then went away from their computer and came back and completed it the next day (all three of these participants completed all parts of the study and so were included in all analyses). Excluding those 3 participants from the time taken suggested the average time to complete the survey was 14 minutes, 39 seconds (SD = 6 minutes, 41 seconds). Regarding ethnicity, 167 participants self-identified as white European, 14 East Asian, 10 Multiracial, 6 'other', 4 Indian, 1 Hispanic, 1 Arab, 2 missing cases. In terms of citizenship, 139 participants were UK citizens, 46 were on student visas, and there were 12 residents, 8 missing cases. Regarding diet, 78 participants self-identified as meat-eaters, 64 as omnivore, 28 limited meat intake, 24 vegetarian, 9 vegan (no animal products), and 2 missing cases.

**7.2.2 Design.** The entire study was completed online. Participants were given informed consent, and were then randomly assigned to one of four experimental conditions. Participants were instructed to write a few convincing sentences about their assigned topic (self-persuasion task). There was a minimum time set for participants, so they could only move on to the dependent measures when they had spent at least 2 minutes on the writing task. There was no maximum time participants were allowed to spend on the writing task. Participants were then given the dependent measures, were debriefed and then given 0.5 course credit.

**7.2.3 Manipulations.** Participants were randomly assigned to complete one of four manipulations; two about human supremacy over animals, one about non-addicts over supremacy drug addicts; and one control condition

(book readers not being superior to TV watchers). We first describe the two human-animal manipulations, before describing the human manipulations.

***Human supremacy is arbitrary.*** This manipulation was a shorter version of the 'human supremacy is arbitrary' manipulation used in study 2.

> "The criteria people use, for saying humans are superior to animals, is made up. Some people say humans are 'superior' to animals because we are more intelligent or sophisticated - but humans choose what it means to be superior based on something we think we are good at (e.g., intelligence). But why should 'intelligence' be the criteria for whether a species is superior? We decided that we are superior to animals. If the criteria for supremacy was 'living a long life', then whales would be considered superior to humans."

***Negative human qualities.*** This manipulation was the same as the 'negative human qualities' in study 2.

***Challenging Non-addict supremacy.*** To challenge non-addict supremacy, we used the same manipulation as in study 1.

***Control condition.*** Our control condition was the same as the control condition from study 1.

#### 7.2.4 Measures

The measures were identical to Study 1; except for the addition of a measure of homeless inequality.

***Homeless inequality.*** The homeless inequality was measured with the same questions as previous measures of inequalities but adapted for relations between homeless men and homeowners. The four items in the scale were: 'People who own homes are superior to homeless men who live on the streets', 'It is okay that people who own homes benefit from the current order of society', 'It is okay that homeless men suffer from the current order of society', and 'I accept the way others treat homeless men in the UK'. The scale had good internal reliability, $\alpha = 0.80$, 95% CI [0.75, 0.84]). Responses were scored from 0 (*Totally Disagree*), through 50 (Neutral), to 100 (*Totally Agree*). In addition, a Principal Components Analysis with manual extraction of one component supported the solution containing the 4-items, $X_2$ (2) = 53.53, $p < .001$.

### 7.3 Results

**7.3.1 Analysis strategy.** We employed both frequentist (using SPSS software) and Bayesian analyses (using JASP software), and ran different models with and without SDO as a covariate. Unlike null hypothesis significance testing, Bayesian model comparison allows for tests in favour of the null hypothesis. Bayesian analyses also allows for model comparison between the null, the covariate, the independent variable, and the independent variable controlling for the covariate. We also ran our main analyses with and without the ethnic minorities and vegetarians/vegans.

**7.3.2 Preliminary data treatment.** We had 237 people sign up to the study. Of those, 213 completed the measures of the survey. Out of those, only 205 completed the written manipulation and the measures.

**7.3.3 Missing data.** There was no missing data in this study.

**7.3.4 Manipulation check.** We inspected the written responses of participants. We found that 3 participants in the 'human supremacy is arbitrary' condition and 2 participants in the control condition did not follow instructions. All participants in the drug addict's condition and the negative human qualities condition followed instructions. We included all participants in analyses because we did not have specific plans for qualitative exclusion. For example, one participant in the 'human supremacy is arbitrary' condition who wrote in the wrong direction of the argument wrote that:

"Humans, though technically animals, are superior to many other types of animals and mammals. Humans have some of the most complex brain capacity, allowing the innovation seen throughout our history. Whilst many animals do things like build and hunt and gather, etc., humans have had the capacity to grow and create societies and infrastructure and colonize and in some ways can be seen as the top of the food-chain. While yes, some animals may prey on humans in the wild, humans have adapted artificially to protect themselves and remain "top dog"".

An example of someone who did not follow instructions in the control condition wrote that:

"I would disagree with this statement as it tends to be that those who do read books have an expanded vocabulary as they are opening themselves up to new words which take more processing than 8 and so means that they are more likely to remember them. As well it could be said that those who read

have more of an imagination as they are required to use their imagination more with reading and so this could translate into everyday life."

An example of someone who followed instructions in the human supremacy is arbitrary condition wrote eloquently that:

"Peter Singer, the popular contemporary ethicist, is an outspoken critic of 'anthropocentric bias', or that we as human beings place ourselves at the centre of most of our appraisals. Considering the idea of intelligence (per the example), even the conception of intelligence being wielded by the question expresses this anthropocentric bias - there are likely other organisms which possess more advanced neurological faculties than we do. Perhaps some animals have a more developed social sense than we, or perhaps some have a more developed memory than we do; provided this was the case, people wouldn't be satisfied with calling these animals more intelligent than we are, even if we were to deconstruct what 'intelligence' is comprised of, and show them to be superior. We intuitively manipulate factors to place ourselves, human beings, at the top of the food-chain, which seems to reflect an internal bias which is likely wrong. Even beyond that, it seems like we enact this behaviour to satisfy a need of ours, rather than to express some objective truth. An abundance of research has been completed within Social Psychology to suggest that people will subconsciously make decisions which make the groups to which they belong seem superior to other groups, even if these evaluations are mistaken. Along the same lines, a part of our identities is as members of the human race, so it'd make sense that we fabricate lines of logic to prove that we are superior to all other life."

This is a good example of the richness and complexity of the qualitative answers that some participants gave. The participant even goes as far as criticising the very framing of the question, and pulls apart the premises of the prompt. While this is an unusually articulate and thought provoking response, their writing provides important qualitative data. Complete analyses of the qualitative data is beyond the scope of this thesis, and could be a promising avenue for future work.

An example of a participant in the control condition who followed instructions wrote that:

"Reading books is not a superior activity to watching TV because the same information can be absorbed by either activity, just in alternative ways. People learn and pick up information in different ways and so it may be more beneficial for some people to watch TV to pick up this information as they may find this easier, you cannot discriminate the two people in this way as it does not differentiate their knowledge input necessarily, just their style of learning."

**7.3.5 Correlational results.** Please see Table 7.1 for correlations between all variables in study 3 with frequentist p-values, and Bayes factors. When taken together, the correlational results from study 3 corroborate the correlational results from studies 1 and 2. That is, supporting our first correlational hypotheses, the attitudes towards all four inequalities (human-animal, drug addict, Bangladesh, homeless) were all positively correlated. In addition, support for the homeless inequality was strongly related to both human-animal and human inequalities.

As expected, support for the homeless and drug addicts inequality were very strongly correlated. Unexpectedly, support for the homeless and Bangladesh inequalities were also very strongly correlated. Departing from the previous two studies, attitudes towards human-animal inequality were actually correlated more strongly with the drug addict and Bangladesh inequality than in study 1 and study 2. However, in sum, these correlational results provide further evidence that human-animal inequality is not asymmetrically correlated to human inequalities, and support our second correlational hypothesis.

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the Bangladesh and homeless inequalities. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO was more strongly correlated with attitudes towards the human inequalities.

Table 7.1. Showing Pearson correlations, p-values, and Bayes factors between all variables in study 3.

| Variable | | 1.Human-animal | 2.Drug addict | 3.Bangladesh | 4.Homeless | 5.SDO | 6.PO | 7.Animals warmth | 8.Addicts warmth | 9.Workers warmth |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.57 | | | | | | | | |
| | p | < .001 | | | | | | | | |
| | $BF_{10}$ | 3.97e+16 | | | | | | | | |
| 3 | r | 0.50 | 0.58 | | | | | | | |
| | p | < .001 | < .001 | | | | | | | |
| | $BF_{10}$ | 3.69e+11 | 1.52e+17 | | | | | | | |
| 4 | r | 0.59 | 0.75 | 0.68 | | | | | | |
| | p | < .001 | < .001 | < .001 | | | | | | |
| | $BF_{10}$ | 3.70e+17 | 2.03e+35 | 1.31e+26 | | | | | | |
| 5 | r | 0.45 | 0.43 | 0.51 | 0.52 | | | | | |
| | p | < .001 | < .001 | < .001 | < .001 | | | | | |
| | $BF_{10}$ | 6.91e+8 | 7.94e+7 | 2.00e+12 | 8.27e+12 | | | | | |
| 6 | r | 0.20 | 0.22 | 0.26 | 0.28 | 0.24 | | | | |
| | p | .002 | <.001 | < .001 | < .001 | < .001 | | | | |
| | $BF_{10}$ | 9.11 | 26.72 | 218.91 | 834.48 | 85.37 | | | | |
| 7 | r | -0.44 | -0.23 | -0.21 | -0.28 | -0.19 | -0.04 | | | |
| | p | < .001 | <.001 | .001 | < .001 | .003 | .305 | | | |
| | $BF_{10}$ | 4.19e+8 | 32.80 | 14.44 | 753.66 | 6.91 | 0.14 | | | |
| 8 | r | -0.31 | -0.56 | -0.26 | -0.43 | -0.21 | -0.16 | 0.15 | | |
| | p | < .001 | < .001 | < .001 | < .001 | .001 | .011 | 0.016 | | |
| | $BF_{10}$ | 5433.66 | 3.11e+15 | 213.45 | 1.33e+8 | 17.96 | 2.37 | 1.70 | | |
| 9 | r | -0.27 | -0.24 | -0.49 | -0.37 | -0.32 | -0.23 | 0.27 | 0.31 | |
| | p | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | |
| | $BF_{10}$ | 356.58 | 86.26 | 1.46e+11 | 6.82e+5 | 7306.23 | 49.09 | 317.01 | 4596.46 | |
| 10 | r | -0.23 | -0.30 | -0.31 | -0.44 | -0.25 | -0.14 | 0.27 | 0.59 | 0.57 |
| | p | < .001 | < .001 | < .001 | < .001 | < .001 | .022 | < .001 | < .001 | < .001 |
| | | 39.00 | 2344.99 | 5996.78 | 4.25e+8 | 97.06 | 1.28 | 394.94 | 1.15e+18 | 3.46e+16 |

Note: r = Pearson correlation; p = p-value; $BF_{10}$ = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh, homeless = inequalities; Workers warmth = warmth towards Bangladesh; 10 = warmth towards homeless me

When looking at warmth, feelings of warmth towards animals was negatively correlated with support for human-animal inequality. However, dissimilar to studies 1 and 2, feelings of warmth towards animals was also negatively associated with support for human inequalities. Warmth towards animals was not correlated with warmth towards drug addicts. However, again dissimilar to studies 1 and 2, warmth towards animals was positively associated with warmth towards Bangladesh sweatshop workers and towards homeless men.

Warmth towards drug addicts was strongly and negatively correlated with support for the drug addict inequality (far more so than warmth towards animals and the support for human-animal inequality), and so too was warmth towards Bangladesh workers and support for the Bangladesh inequality. Feelings of warmth towards drug addicts were also positively correlated with warmth towards Bangladesh workers, and very strongly correlated with warmth towards homeless men. In addition, feelings of warmth and support for the inequality correlate highly for all target groups. Feelings of warmth towards each target group was strongly correlated with both human-animal and all human inequalities.

In study 1, feelings of warmth towards animals did not predict support for human inequalities, and feelings for warmth towards humans did not predict support for human-animal inequalities (although warmth towards sweatshop workers did weakly correlate with support for human-animal inequality). In study 2, warmth towards animals moderately predicted support for the Bangladesh inequality, and neither warmth towards drug addicts or sweatshop workers was associated with support for human-animal inequality. In the current study, warmth towards animals was moderately and negative correlated with support for the homeless inequality (but not the drug addict or Bangladesh inequalities). In addition, support for human-animal inequality was correlated negatively with warmth towards drug addicts, sweatshop workers, and homeless men (in descending order).

Taken together, compared to the general UK population (studies 1 and 2) these correlational results show that for undergraduate psychology

students, feelings of warmth and support for inequalities were more likely to occur across species lines (e.g., warmth towards animals associated with support for human inequalities, and warmth towards humans associated with support for human-animal inequality). In other words, for undergraduate psychology students, feelings and attitudes towards humans and animals are more closely aligned than for the wider UK public.

**7.3.6 Experimental Results.** To examine the impact the manipulations had on the dependent variables, we ran multiple ANOVAs, with and without controlling for SDO as a covariate. We also examined the Bayesian model comparison with and without vegetarians and vegans, to see whether the effects remained for omnivores.

***Human-animal inequality.*** See Figure 7.1 below for the mean level of support for human-animal inequality between conditions. To examine the impact that the manipulations had on the support for human-animal inequality, we ran an ANOVA which revealed a significant main effect of condition, $F(3, 201), = 4.50$, $p = .004$, $\eta_p^2 = 0.06$, $BF_M = 1.34e\text{-}9$. Levene's test of homogeneity of variance was not violated, $F(3, 200) = .58$, $p = .631$. When entering SDO into the model, SDO was a significant covariate, $F(1, 199), = 55.07$, $p < .001$, $\eta_p^2 = 0.22$, $BF_M = 0.08$, and the overall model improved, $F(3, 199), = 5.96$, $p < .001$, $\eta_p^2 = 0.08$, $BF_M = 106.78$.

Bayesian model comparison revealed strong support for the interaction between condition and SDO best predicting support for human-animal inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M = 2.74e\text{ -}10$) predicting support for human-animal inequality. Frequentist post-hoc comparisons revealed that participants in the arbitrary condition ($M = 27.47$, $SD = 18.39$) had significantly lower endorsement of human-animal inequality compared with all other conditions. There were no other significant differences between conditions. Bayesian post hoc comparisons revealed good evidence that participants in the arbitrary condition endorsed human-animal inequality less than participants in the control condition (M = 38.79, SD = 16.01, $p = .002$, $BF_{10,\cup} = 17.12$), and the human downfall condition (M = 36.48, SD = 16.13, $p = .012$,

$BF_{10,\cup}$ = 4.38). There was frequentist support but inconclusive Bayesian evidence that participants in the arbitrary condition endorsed human-animal inequality less than participants in the drug addict's condition (M = 35.66, SD = 16.07, $p$ = .005, $BF_{10,\cup}$ = 2.71). We consider the effect between the arbitrary and drug addict condition to be inconclusive and therefore not a meaningful difference.

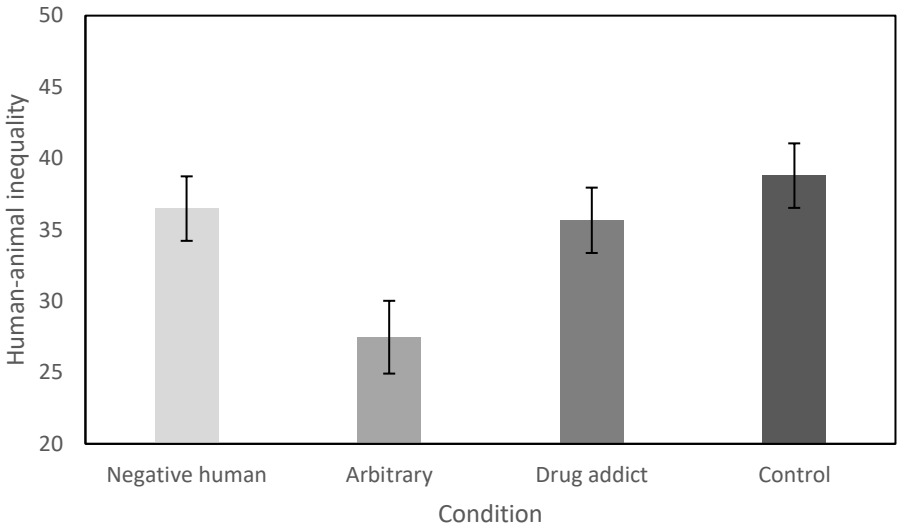


*Figure 7.1.* Showing participants in the human supremacy is arbitrary displayed less support for human-animal inequality than the negative human or control condition, and marginally less than the drug addicts' condition. Higher numbers equal more support. Error bars are +/- 1 standard error.

We then analysed the data excluding vegetarians and vegans. See table 7.2 below for Bayesian model comparison with and without vegetarians and vegans, predicting endorsement of human-animal inequality. See Table 7.3 for means of the endorsement of human-animal inequality with and without vegetarians. The interpretation of the Bayesian model comparison results were the same when ran without vegetarians or vegans: the interaction between SDO and condition best predicted the data. There were three differences in the results of the Bayesian post hoc comparisons when excluding vegetarians and vegans. First, the results showed less support for the difference between participants in the arbitrary condition endorsing human-animal inequality less than participants in the control condition ($BF_{10,\cup}$ = 4.78) or the human downfall condition ($BF_{10,\cup}$ = 3.33), although these effects still provide support for a difference between conditions. Secondly, the inconclusive evidence that

participants in the arbitrary condition endorsed human-animal inequality less than participants in the drug addict's condition improved ($BF_{10,U}$ = 3.45). Taken together, excluding vegetarians and vegans from analyses did not greatly alter the interpretation of the impact that condition and SDO had on the endorsement of human-animal inequality.

Table 7.2. Bayesian model comparison shows the interaction between Condition and SDO best predicts endorsement of human-animal inequality, with and without vegetarians and vegans.

| Model | $BF_M$ | $BF_M$ (excluding vegetarians) |
|---|---|---|
| Condition + SDO | 106.78 | 50.61 |
| SDO | 0.08 | 0.18 |
| Condition | 1.34e-9 | 8.85e -7 |
| Null model | 2.74e -10 | 3.20e -7 |

Note: All priors are set evenly at 0.25 in JASP.

Table 7.3. Comparing means and standard deviations for the endorsement of human-animal inequality, by condition, with and without vegetarians.

| | All participants | | Excluding vegetarians | |
|---|---|---|---|---|
| Condition | Mean (SD) | N | Mean (SD) | N |
| Negative human | 36.48 (16.13) | 51 | 39.11 (15.24) | 44 |
| arbitrary | 27.47 (18.39) | 52 | 29.87 (18.99) | 43 |
| Drug addicts | 35.66 (16.07) | 52 | 38.98 (14.15) | 43 |
| Control | 38.45 (16.00) | 49 | 39.90 (15.11) | 41 |

***Warmth towards animals.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards animals. See Figure 7.2 below for the mean feelings of warmth towards animals per condition. The results revealed no difference in feelings of warmth towards animals between conditions, $F(3, 201) = .21$, $p = .891$, $\eta_p^2 = 0.03$, $BF_M = 0.01$. Levene's test of homogeneity of variance was not significant, $F(3, 200) = .079$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 199) = 7.50$, $p = .007$, $\eta_p^2 = .036$, $BF_M = 12.81$, and the overall model remained non-significant, $F(3, 199) = 1.87$, $p = .905$, $\eta_p^2 = .00$, $BF_M = .08$. Further, Bayesian model comparison showed inconclusive evidence for the null model,

$BF_M$ = 0.57. Together, Bayesian model comparison suggests individual differences in SDO best predict warmth towards animals.

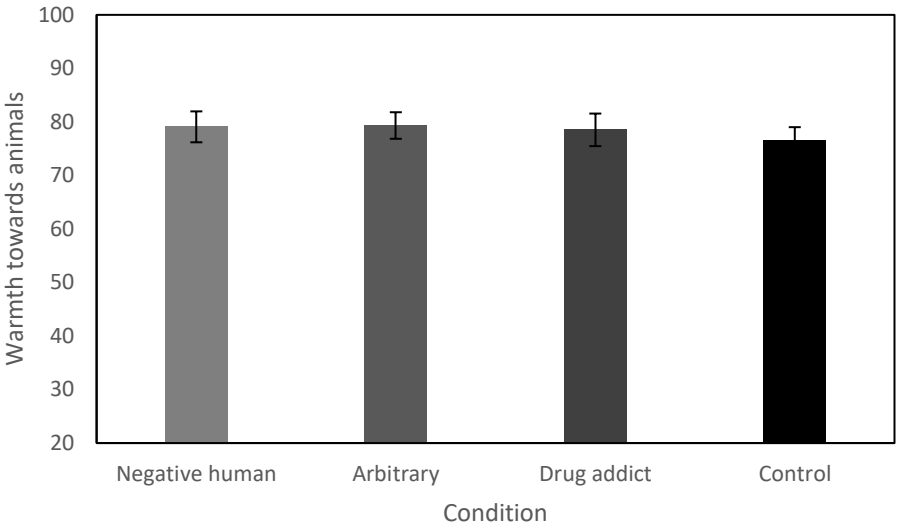


*Figure 7.2.* Showing no difference in the mean feelings of warmth towards animals per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Drug addict inequality.*** To examine the impact that the manipulations had on the support for the drug addict inequality, we ran an ANOVA which revealed a significant main effect of condition, $F(3, 201), = 2.96$, $p = .033$, $\eta_p^2 = 0.04$, $BF_M = 3.94e\text{-}8$. See figure 7.3 below for the mean level of support for the drug addict inequality. Levene's test of homogeneity of variance was not violated, but was marginally significant, $F(3, 201) = 2.28$, $p = .080$. When entering SDO into the model, SDO was a significant covariate, $F(1, 199), = 43.81$, $p < .001$, $\eta_p^2 = 0.18$, $BF_M = 3.56$, and the overall model remained unchanged, $F(3, 199), = 2.88$, $p = .037$, $\eta_p^2 = 0.04$, $BF_M = 2.52$.

Bayesian model comparison revealed support for SDO, and inconclusive support for the interaction between condition and SDO, predicting support for the drug addict inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M = 4.56e\text{ }\text{-}8$) predicting support for the drug addict inequality. Post-hoc comparisons revealed that participants in the arbitrary condition ($M = 24.59$, $SD = 20.70$) had marginally significantly lower endorsement of the drug addict

inequality compared with the control condition (M = 33.75, SD = 18.57, $p$ = .054, $BF_{10,\cup}$ = 2.30). Participants in the drug addicts' condition (M = 23.63, SD = 16.31) also displayed marginally significantly less endorsement of the drug addict inequality compared to controls, $p$ = .099, $BF_{10,\cup}$ = 8.41, however there was Bayesian support for this difference. There were no other (marginally) significant or significant differences between conditions. It is interesting to note the differences in post-hoc results between frequentist and Bayesian analyses (see Discussion of this section).

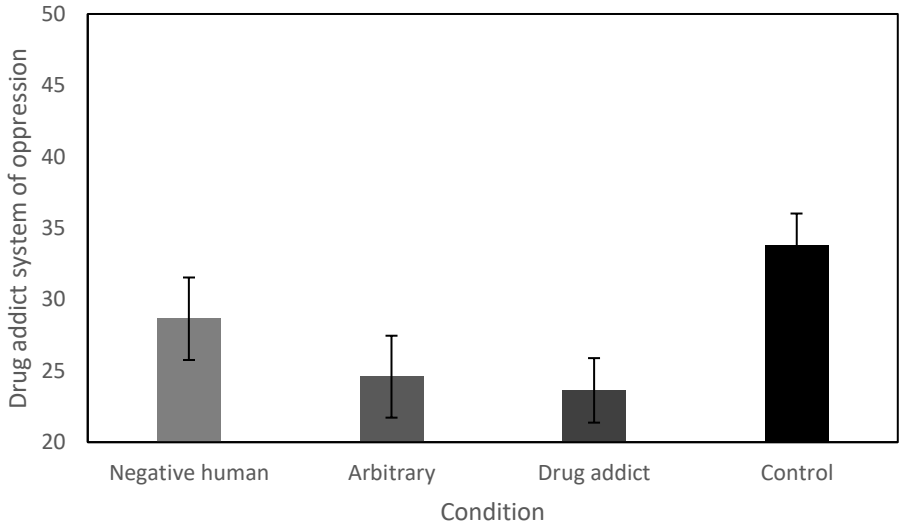


*Figure 7.3.* Showing participants in the human supremacy is arbitrary and the drug addict condition displayed marginally significantly less support for the drug addict inequality than the control condition, but not the negative human qualities condition. Higher numbers equal more support. Error bars are +/- 1 standard error. Note the difference between the arbitrary condition and the control condition did not remain when excluding vegetarians.

We then analysed the data excluding vegetarians and vegans. Support for the overall model decreased and support for SDO predicting support for the drug addict inequality increased. Support against condition alone or the null model predicting support for the drug addict inequality remained very strong. In looking at the Bayesian post hoc comparisons without vegetarians and vegans, the support for a difference in endorsement of the drug addict inequality between the arbitrary and control condition ($BF_{10,\cup}$ = 0.73), and the drug addicts and control condition ($BF_{10,\cup}$ = 3.20) both decreased. There were no other differences in the results when excluding vegetarians or vegans. Overall, when excluding vegetarians and vegans, the model comparison

results remained the same, however, there was less support for the Bayesian post hoc comparisons. See Table 7.4 and Table 7.5 below for Bayesian model comparison with and without vegetarians and vegans, predicting endorsement of the drug addict inequality.

Table 7.4. Showing Bayesian model comparison with and without vegetarians and vegans, predicting endorsement of the drug addict inequality.

| Model | $BF_M$ | $BF_M$ (excluding vegetarians) |
|---|---|---|
| SDO | 3.56 | 13.04 |
| Condition + SDO | 2.52 | 0.69 |
| Null model | 4.56e -8 | 1.81e -5 |
| Condition | 3.94e-8 | 5.31e -6 |

Note: All priors are set evenly at 0.25 in JASP.

Table 7.5. Showing means and standard deviations for the endorsement of the drug addict inequality, by condition, with and without vegetarians.

| | All participants | | Excluding vegetarians | |
|---|---|---|---|---|
| Condition | Mean (SD) | N | Mean (SD) | N |
| Negative human | 28.65 (20.66) | 51 | 30.21 (20.64) | 44 |
| arbitrary | 24.59 (20.70) | 52 | 27.05 (21.35) | 43 |
| Drug addicts | 23.63 (16.31) | 52 | 24.74 (16.15) | 43 |
| Control | 33.75 (18.57) | 49 | 34.30 (19.06) | 41 |

***Warmth towards drug addicts.*** We ran an ANOVA model to examine any differences in perceptions of warmth towards drug addicts. See Figure 7.4 below for the mean feelings of warmth towards drug addicts per condition. The results revealed no difference in feelings of warmth towards drug addicts between conditions, $F(3, 201) = .43$, $p = .730$, $\eta_p^2 = 0.00$, $BF_M = 0.01$. Levene's test of homogeneity of variance was not significant, $F(3, 200) = .89$, $p = .447$ When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 199) = 8.92$, $p = .003$, $\eta_p^2 = .043$, $BF_M = 25.51$, and the overall model remained non-significant, $F(3, 199) = 0.28$, $p = .840$, $\eta_p^2 = .00$, $BF_M = 0.10$. Further, Bayesian model comparison showed inconclusive evidence for the null model, $BF_M = 0.23$. Together, Bayesian model comparison suggests individual differences in SDO best predict warmth towards drug addicts.

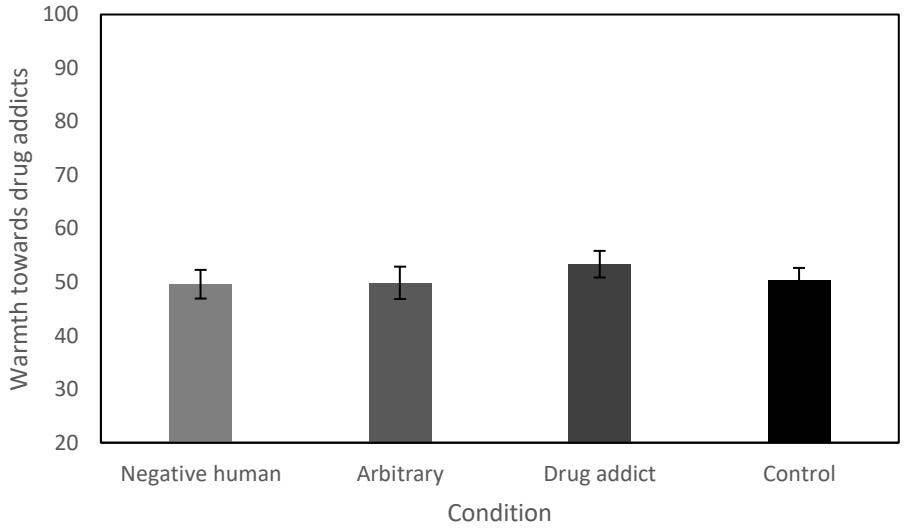


*Figure 7.4.* Showing no difference in the mean feelings of warmth towards drug addicts per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Bangladesh inequality.*** To examine the impact that the manipulations had on the support for the Bangladesh inequality, we ran an ANOVA which showed no main effect of condition, $F(3, 201)$, = 1.38, $p$ = .252, $\eta_p^2$ = 0.02, $BF_M$ = 3.59e -13. See figure 7.5 below for the mean level of support for the Bangladesh inequality per condition. Levene's test of homogeneity of variance was not violated, but was marginally significant, $F(3, 201)$ = 2.13, $p$ = .097. When entering SDO into the model, SDO was a significant covariate, $F(1, 199)$, = 73.43, $p$ < .001, $\eta_p^2$ = 0.27, $BF_M$ = 8.03, and the overall model improved and became marginally significant, $F(3, 199)$, = 2.25, $p$ = .084, $\eta_p^2$ = 0.03, $BF_M$ = 1.12.

Bayesian model comparison revealed moderate support for SDO predicting support for the Bangladesh inequality, and inconclusive support for the interaction between condition and SDO predicting support for the Bangladesh inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M$ = 2.87e -12) predicting support for the Bangladesh inequality.

Post-hoc Bayesian comparisons revealed inconclusive evidence that there were any meaningful differences between any conditions in the endorsement of the Bangladesh inequality, 0.10 < all $BF_{10, U}$ < 0.37. Because

the main frequentist ANCOVA did not yield a significant result, and the Bayesian analyses were inconclusive, we did not break down the SDO x Condition interaction, and did not make any post hoc frequentist comparisons.

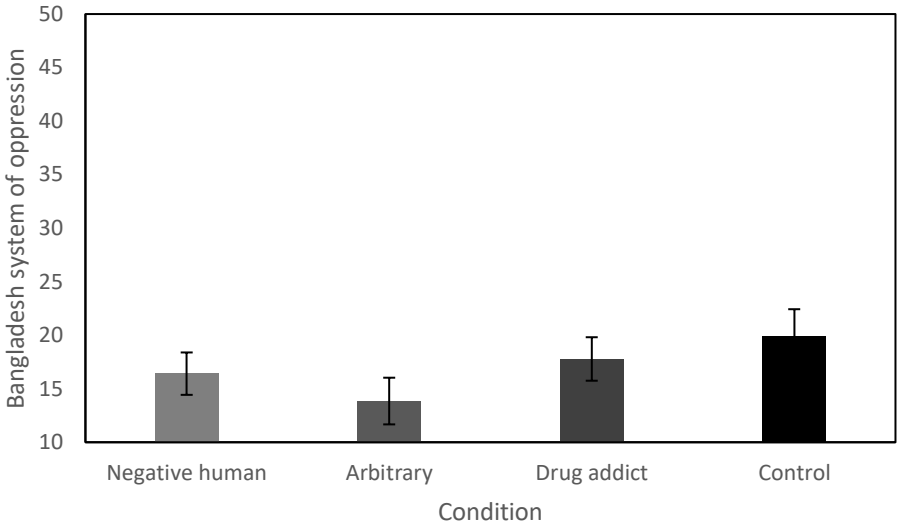


*Figure 7.5.* Showing no difference in the mean level of support for the Bangladesh inequality between conditions. Higher numbers equal more support. Error bars are +/- 1 standard error.

See Table 7.6 and Table 7.7 below for Bayesian model comparison with and without vegetarians, predicting endorsement of the Bangladesh inequality. When analyzing the data excluding vegetarians, we found improved support for SDO alone best predicting the endorsement of the Bangladesh inequality. The condition plus SDO interaction remained inconclusive. The support against either the null model or condition alone predicting the endorsement of the Bangladesh inequality remained very strong.

Table 7.6. Showing Bayesian model comparison with and without vegetarians, predicting endorsement of the Bangladesh inequality.

| Model | $BF_M$ | $BF_M$ (excluding vegetarians) |
|---|---|---|
| SDO | 8.03 | 26.89 |
| Condition + SDO | 1.12 | 0.34 |
| Null model | 2.87e -12 | 7.84e -10 |
| Condition | 3.59e - 13 | 5.21e -11 |

Note: All priors are set evenly at 0.25 in JASP.

Table 7.7. Showing means and standard deviations for the endorsement of the Bangladesh inequality, by condition, with and without vegetarians.

| | All participants | | Excluding vegetarians | |
|---|---|---|---|---|
| Condition | Mean (SD) | N | Mean (SD) | N |
| Negative human | 16.41 (14.12) | 51 | 17.35 (14.16) | 44 |
| arbitrary | 13.85 (15.74) | 52 | 15.99 (16.32) | 43 |
| Drug addicts | 17.78 (14.61) | 52 | 18.35 (14.79) | 43 |
| Control | 19.89 (17.75) | 49 | 20.74 (18.09) | 41 |

***Warmth towards Bangladesh sweatshop workers.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards Bangladesh sweatshop workers See Figure 7.6 below for the mean feelings of warmth towards Bangladeshi workers per condition. The results revealed no difference in feelings of warmth towards Bangladesh sweatshop workers between conditions, $F(3, 201) = .10$, $p = .962$, $\eta_p^2 = 0.00$, $BF_M = 1.91e - 6$. Levene's test of homogeneity of variance was not significant, $F(3, 200) = .69$, $p = .562$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 199) = 22.74$, $p < .001$, $\eta_p^2 = .10$, $BF_M = 95.53$, and the overall model remained non-significant, $F(3, 199) = .214$, $p = .887$, $\eta_p^2 = .00$, $BF_M = 09$. Further, Bayesian model comparison showed strong evidence against the null model, $BF_M = 7.02e -4$. Together, Bayesian model comparison strongly shows individual differences in SDO best predict warmth towards Bangladesh sweatshop workers.

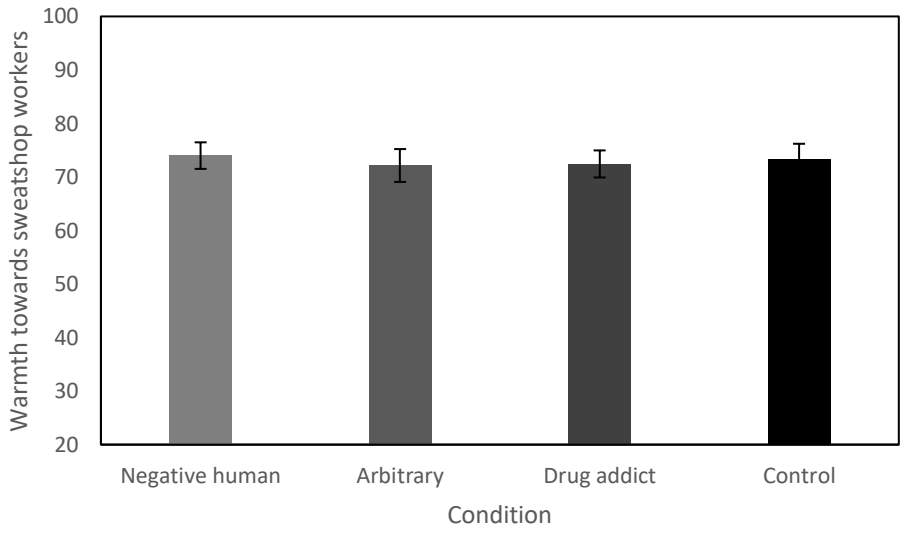


*Figure 7.6.* Showing no difference in the mean feelings of warmth towards Bangladesh workers per condition. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Homeless inequality.*** To examine the impact that the manipulations had on the support for the Homeless inequality, we ran an ANOVA which showed no main effect of condition, $F(3, 201), = 1.65$, $p = .178$, $\eta_p^2 = 0.02$, $BF_M = 1.22e\text{ -}13$. See figure 7.7 below for the mean level of support for the homeless inequality per condition. Levene's test of homogeneity of variance was not violated, $F(3, 201) = 1.62$, $p = .187$. When entering SDO into the model, SDO was a significant covariate, $F(1, 199), = 75.74$, $p < .001$, $\eta_p^2 = 0.28$, $BF_M = 9.60$, and the overall model improved and became marginally significant, $F(3, 199), = 2.08$, $p = .104$, $\eta_p^2 = 0.03$, $BF_M = 0.94$.

Bayesian model comparison revealed moderate support for SDO predicting support for the Homeless inequality, and inconclusive support for the interaction between condition and SDO predicting support for the Homeless inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M = 7.39e\text{ -}13$) predicting support for the Homeless inequality.

Post-hoc Bayesian comparisons revealed inconclusive evidence that there were any meaningful differences between any conditions in the endorsement of the Homeless inequality, $0.22 <$ all $BF_{10, U} < 1.32$. Because the main frequentist ANCOVA did not yield a significant result, we did not break down the SDO x condition interaction, and did not make any post hoc frequentist comparisons.

We then re-ran the Bayesian main analyses without vegetarians. The interpretation of the results remained the same, and the support for SDO alone best predicting the Homeless inequality improved. See Table 7.8 and Table 7.9 below for Bayesian model comparison with and without vegetarians, predicting endorsement of the Homeless inequality.

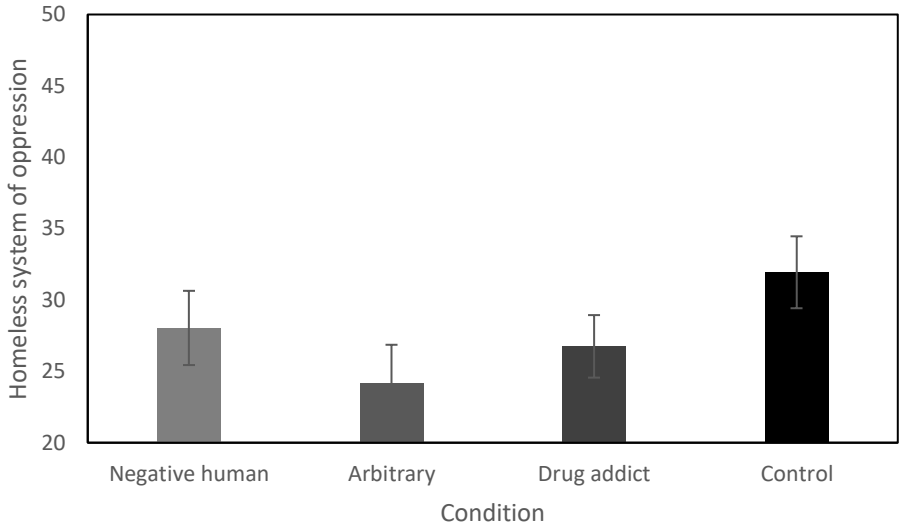


*Figure 7.7.* Showing no difference in the mean level of support for the homeless inequality between conditions. Higher numbers equal more support. Error bars are +/- 1 standard error.

Table 7.8. Showing Bayesian model comparison with and without vegetarians, predicting endorsement of the Homeless inequality.

| Model | $BF_M$ (all participants ) | $BF_M$ (excluding vegetarians) |
|---|---|---|
| SDO | 9.60 | 18.71 |
| Condition + SDO | 0.94 | 0.48 |
| Null model | 7.39e -13 | 9.83e -10 |
| Condition | 1.22e -13 | 1.14e -10 |

Table 7.9. Showing means and standard deviations for the endorsement of Homeless inequality, by condition, with and without vegetarians.

| | All participants | | Excluding vegetarians | |
|---|---|---|---|---|
| Condition | Mean (SD) | N | Mean (SD) | N |
| human downfall | 28.04 (18.60) | 51 | 29.98 (18.51) | 44 |
| arbitrary | 24.18 (19.33) | 52 | 26.79 (19.63) | 43 |
| Drug addicts | 26.76 (15.76) | 52 | 28.61 (15.23) | 43 |
| Control | 31.78 (17.95) | 49 | 33.71 (17.47) | 41 |

***Warmth towards homeless men.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards homeless men. See Figure 7.8 below for the mean feelings of warmth towards homeless men per condition. The results revealed no difference in feelings of warmth towards homeless men between conditions, $F(3, 201) = .68$, $p = .568$, $\eta_p^2 = 0.01$, $BF_M = 0.00$. Levene's test of homogeneity of variance was not significant, $F(3, 200) = 1.67$, $p = .175$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 199) = 13.17$, $p < .001$, $\eta_p^2 = .06$, $BF_M = 40.11$, and the overall model remained non-significant, $F(3, 199) = .72$, $p = .543$, $\eta_p^2 = .01$, $BF_M = 0.17$. Further, Bayesian model comparison showed inconclusive evidence against the null model, $BF_M = 0.04$. Together, Bayesian model comparison strongly shows individual differences in SDO best predict warmth towards homeless men.

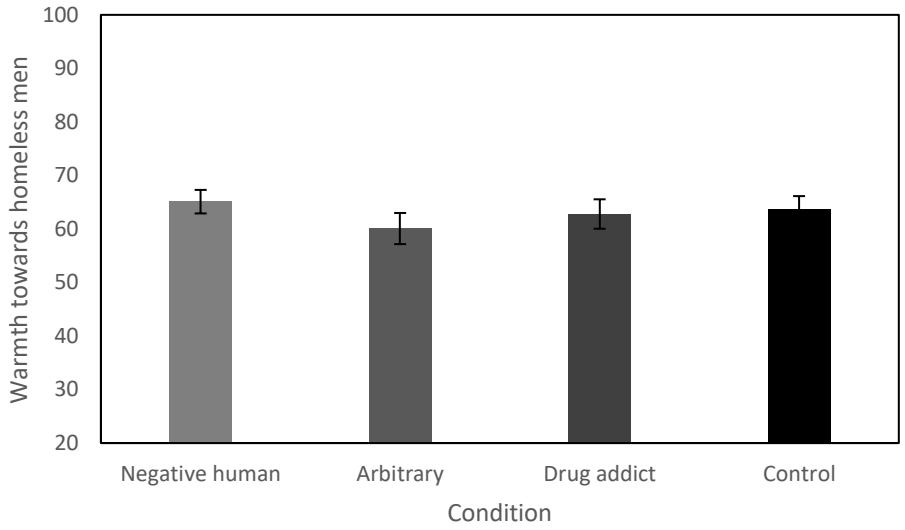


*Figure 7.8.* Showing no difference in the mean feelings of warmth towards homeless men between conditions. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

## 7.4 Discussion

**7.4.2 Correlational Results.** The correlational results supported both our correlational hypotheses. Support for human-animal inequality is strongly correlated with support for all three human inequalities measured. That is, supporting our first correlational hypotheses, the attitudes towards all four inequalities (human-animal, drug addict, Bangladesh, homeless) were all positively correlated. In addition, support for the homeless inequality was strongly related to both human-animal and human inequalities.

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the Bangladesh and homeless inequalities. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO was more strongly correlated with attitudes towards the human inequalities.

In addition, and supporting our hypotheses, human-animal inequality was not foundational to other inequalities. That is, human inequality were correlated more strongly with each other than with human-animal inequality. As expected, support for the homeless and drug addicts inequality were very strongly correlated. Unexpectedly, support for the homeless and Bangladesh

inequalities were also very strongly correlated. Departing from the previous two studies, attitudes towards human-animal inequality were actually correlated more strongly with the drug addict and Bangladesh inequality than in study 1 and study 2.

Taken together, we again found strong evidence that the endorsement of human-animal inequality was related to the endorsement of human inequality, however, it was not asymmetrically related to human inequalities.

### 7.4.3 Experimental results

***Human-animal inequality.*** Overall, participants endorsed human-animal inequality more than any of human inequality. We found that participants in the human supremacy is arbitrary condition showed significantly less endorsement of human-animal inequality than the other three conditions. This effect persisted when controlling for individual differences in SDO, and when excluding vegetarians from the analyses. However, the post hoc comparisons were less pronounced when excluding vegetarians from the analyses. In addition, we found good evidence that challenging non-addict supremacy did not have a downstream effect for reducing endorsement of human-animal inequality.

***Drug addict inequality.*** We found a main effect of condition in the endorsement of the drug addict inequality. We found that participants who had just written a paragraph arguing that non-addicts are not superior to drug addicts showed marginally significantly less endorsement of the drug addict inequality than controls. We also found that participants in the 'human supremacy is arbitrary' condition (but not the human downfall condition), showed marginally significantly less endorsement of the drug addict inequality than controls. However, when analysing the data without vegetarians, the support for the interaction between condition and SDO became inconclusive using Bayesian analyses.

***Bangladesh inequality.*** All participants revealed a low level of support for the Bangladesh inequality. There was no main effect of condition, and there was inconclusive evidence for an SDO x condition interaction. The results became clearer that SDO alone best predicted support for the Bangladesh

inequality when excluding vegetarians and vegans. Participants in the human supremacy is arbitrary condition did display lower support for the Bangladesh inequality, however, the difference was not significant, or supported by Bayesian analyses. In addition, the difference between conditions was weaker when excluding vegetarians and vegans. Taken together, there was good evidence that SDO alone best predicted support for the Bangladesh inequality.

***Homeless inequality.*** Overall, there was a similar level of support for the Homeless inequality to the drug addict inequality. However, there was inconclusive evidence that there was an interaction between condition and SDO, and strong evidence against the null hypothesis, or condition alone predicting support for the Homeless inequality. Participants in the human supremacy is arbitrary condition did endorse the Homeowner-Homeless inequality less than the other three conditions, however, this difference was not significant. There was good evidence that SDO alone best predicted support for the Homeless inequality, and this difference was stronger when excluding vegetarians from the analyses.

This study revealed that challenging human supremacy over animals can reduce the endorsement of human-animal and drug addict inequalities. One reason why the arbitrary condition, but not the downfall condition showed an effect may be due to the interplay of sample and manipulation. Because psychology undergraduate students are more left-wing than the general population, it is possible that the human supremacy is arbitrary condition was more effective than the human negative qualities as writing about the arbitrary nature of concepts may be more attractive and persuasive of an argument than for the more conservative and more male participants we had in study 1. Moreover, this is because challenging human supremacy may have tackled the foundational inequality (that of humans over animals), which lead to a reduced support for the next most supported inequality – the drug addict inequality. We think the reason why the downfall condition did not yield a similar result is because reminders of humans' negative qualities could have perpetuated human outgroup stereotypes (i.e. towards drug addicts, a highly stereotyped group (Fiske, Cuddy, Glick, & Xu, 2002)) which left human

supremacy over animals intact. Such an interpretation could explain why the downfall condition did not show reduced support for either the human-animal or human inequalities.

The lack of a downstream effect on the Bangladesh or Homeless inequality is interesting. It may be that endorsing human-animal inequality is only able to reduce support for the drug addict inequality, however we think this to be unlikely as all human inequalities correlate positively with support for human-animal inequality. What we think is more likely is that we observed a floor effect whereby all participants reported low levels of support for the inequality, and therefore we could not capture a reduction in support. Indeed, the scores for support for the homeless and Bangladesh inequality were close to the bottom of the scale. Moreover, it is interesting that participants reveal such a low level of support for the Bangladesh inequality, particularly when most participants in this sample – western women – are the very sample who consume the most sweatshop clothing in the world (Statista, 2019). This was an unexpected finding, however, it is a finding that can be explained by the dissonance reduction model proposed by Bastian and Loughnan (2017). That is, sweatshop clothing, like meat, is a morally troublesome product and so people who consume sweatshop clothing are likely to be motivated to justify their morally troublesome behaviour. Alternatively, participants may be unaware of the true cost of their consumer behaviour, and so do not even feel dissonance from writing in this study that they do not support the Bangladesh inequality, even when their behaviour highly likely suggests otherwise. Of course, we do not have a measure of participants' consumer behaviour, and so these comments are speculative in nature. Future research could therefore benefit from including behavioural measures of sweatshop consumption, or consumption of other morally troublesome products and participants endorsement of those products.

Moreover, we also found that challenging supremacy over drug addicts only reduced support for the drug addict inequality, and did not have a downstream effect on support for human-animal inequality, or human inequalities. This finding provides support against the notion that human

inequalities are foundational to human-animal inequality, or indeed other human inequalities.

**7.4.4 Limitations.** There are limitations to study 3 that are worth mentioning. Firstly, we did not have a plan for exclusions in our studies. Specifically, we did not have a plan to only recruit meat eaters, or British people, whom some of the questions were specifically aimed at (e.g., “British people are superior to sweatshop workers from Bangladesh”). There are two reasons why we did not plan our exclusions. Firstly, when recruiting from the undergraduate participant pool at The University of Edinburgh where we recruited this sample from, researchers are not allowed to exclude participants based on gender or ethnicity so that all students have an equal chance to participate in studies. In addition, the most relevant previous literature on human-animal relations has not planned and theoretically justified their exclusions, and so there was no exclusion method for us to follow (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009). Indeed, we excluded vegetarian and non-British participants from analyses because theoretically the study questions were not aimed at non-British participants, and because we wanted to see whether the effects we observed held for meat eaters, or whether it was vegetarians in our sample that were driving the effects observed. The results revealed that removing the vegetarians and non-British participants weakened the observed effects.

Secondly, we did not rigorously check the qualitative written responses from our manipulations. Indeed, the purpose of this thesis was to experimentally manipulate various forms of supremacy and measure the impact on support for various inequalities. However, such rigorous qualitative exploration of the data were beyond the scope of this thesis and the expertise of the researchers. We appreciate there may be additional subtle differences in the written responses of participants which could be further analysed and this would be fruitful work for future qualitative research. Please see the general discussion of this thesis for a more thorough discussion of the potential for future qualitative research arising from the results of this thesis. However, in study 3 we have found an effect of the manipulations of the dependent

variables irrespective of the specific language used by participants to make their argument. These methods – while they have their limitations – are consistent with the most relevant research on the psychology of human-animal relations (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009).

### 7.5 Conclusion

There are two key takeaways from study 3, both that surround the sample we employed. First, we found evidence for the foundational hypothesis, but only in an undergraduate psychology sample. That is, we found that challenging human supremacy could reduce support for both human-animal inequality and the drug addict inequality. In addition, challenging non-addict supremacy did not reduce support for human-animal inequality, further adding support to the foundational hypothesis. These findings are of course in contrast to the null findings in study 1. It is likely that the difference in the findings is down to a combination of the refined human supremacy manipulation employed in this study (human supremacy is arbitrary), and the profile of our participants. Because we found support for the foundational hypothesis only when participants were prompted with 'human supremacy is arbitrary' and not when prompted with the 'negative qualities of humans' suggests that the framing of human supremacy measures may be an important finding for future work on human-animal relations to consider. It is likely that the 'human supremacy is arbitrary' manipulation is more effective and appealing for left wing, young educated women (i.e., our sample) because questioning the legitimacy of supremacy is more so associated with left leaning people (Altemeyer, 1981).

Second, for this sample of undergraduates, feelings of warmth towards outgroups is more strongly correlated with support for corresponding inequalities, and support for human-animal inequality is more strongly correlated with support for human inequalities than a sample from the UK public. That is, more so than the first two studies which were comprised of a more representative UK sample, the current study found that for young, educated, and predominately female undergraduate psychology students,

attitudes towards human-animal and human inequalities are more closely aligned, thus possibly explaining why we found support for the foundational hypothesis in study 3, but not study 1. In other words, the more closely aligned people's support for human-animal and human inequalities are, the more likely it is that changing attitudes towards one inequality will have an impact on attitudes towards another inequality. Indeed, the conceptual similarity between human-animal and human inequalities, and our consistent correlational findings that support for human-animal and human inequalities are related, is integral to the foundational hypothesis of this thesis.

This finding complements the literature by Costello and Hodson (2009; study 1) which found in a sample of 19 year old Canadian psychology undergraduates (76% female) that stronger beliefs in the human-animal divide is associated with dehumanization of Canadian immigrants. Moreover, the current findings complement the research by Bastian, Costello, Loughnan, and Hodson (2012) which found in another sample of 19 year old Canadian psychology undergraduates (82% female), that using a similar sample of experimentally reducing the human-animal divide (by drawing comparisons between animals and humans) can improve moral concern towards human outgroups (Black people, Asians, Muslims, Aboriginal, and immigrants).

Overall, we have mixed evidence for the foundational hypothesis; study 1 did not support the hypothesis whereas study 3 provided initial support. We now turn to chapter 7 and provide our fifth and final empirical chapter to shed more light on the foundational hypothesis.

# Chapter Eight: Lack of Evidence for the Foundational Hypothesis

## 8.1 Introduction

In chapter 7, we presented study 3 that provided initial evidence for the foundational hypothesis, but only in an undergraduate psychology sample. The purpose of study 4 was therefore to replicate study 1 and study 3, to further examine the foundational hypothesis. In addition, we also wanted to employ a behavioural measure of support for the inequalities, and so included a measure of charitable donations (to either a human or an animal charity) in study 4. We wanted to include a behavioural measure of support for inequalities, because in the previous studies we had measured support for inequalities (i.e., attitudes), however we had not measured participants behaviour directly. The charitable donation was a real world donation scenario whereby participants had the option of actually donating their study earnings to charity.

We also wanted to include two measures (creativity and dehumanization) which could be potential mediators of the effects. The results of study 3 may be explained by challenging rigid stereotypical thinking (e.g., the idea of human supremacy) which then increases creativity and divergent thinking generally, which in turn has the downstream effect of reducing support for the drug addict inequality. Previous work has shown that reducing stereotypes can have a positive impact on outgroup attitudes via increased creativity. Goclowska and Crisp (2013) found that exposure to counter-stereotypical people (e.g., a female mechanic), can not only decrease stereotyping of the target individual, but also lead to the generation of creative ideas on a subsequent divergent thinking creativity task. Another study found that encouraging participants to generate counter stereotypic role models reduces outgroup dehumanization via a reduced reliance on heuristic thinking (Prati, Vasiljevic, Crisp, & Rubini, 2015). Therefore, we reasoned that it is possible that the findings of study 3 may be explained by an increase in creativity or divergent thinking, and so we employed a measure of creative divergent thinking in study 4. Drawing on Goclowska and Crisp's (2013) work

on cognitive flexibility and creativity, we hypothesized that one explanation for any changes in attitudes towards inequality stemming from reduced supremacist beliefs could be an increase in cognitive flexibility. Cognitive flexibility can be measured using creativity tasks, and so we employed a measure of creativity to test this hypothesis.

Another possible explanation is that challenging supremacist ideas simply leads to a reduction in dehumanization (Haslam & Loughnan, 2014). Because dehumanization is associated with thinking of outgroups (both human and animal) as being inferior and lacking humanity, reducing supremacist thoughts towards animals could lead to seeing animals in a more favourable and therefore more human light (Haslam & Loughnan, 2014). Because of the association between humanity and moral concern, seeing animals in a more human light could lead to reduced support for the human-animal and drug addict inequalities. We therefore also included measures of dehumanization in this study.

**8.1.1 Correlational hypotheses.** We hypothesized that attitudes towards the human-animals, drug addict, Bangladesh, and homeless inequalities would all be positively correlated. That is, people who support one inequality are likely to support other inequalities (Costello & Hodson, 2014). In line with our previous findings, we did not expect that support for human-animal inequality would be asymmetrically correlated to support for human inequalities.

**8.1.2 Experimental hypotheses.** We had reason to have two experimental hypotheses. On the one hand, we expected to replicate the null effect of study 1 that there would be no difference in the dependent variables by condition (i.e., no support for the experimental foundational hypothesis). However, on the other hand we expected that using University of Edinburgh students as participants would replicate the foundational findings of study 3. We also thought this would be the case because the most relevant research which has manipulated human-animal relations and measured attitudes towards humans has only been published with psychology undergraduate

students (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009).

## 8.2 Method

**8.2.1 Participants.** We wanted to again use University students, however, because we wanted to include a behavioural measure of charitable donations, we needed to use participants we could pay for their time. We therefore recruited Edinburgh University students from 'MyCareer hub', an advertising website for University of Edinburgh students. Sample size was determined a priori using g*power software. Using α = .05; power = .80; and f = 0.25 for an ANCOVA with three conditions suggested 158 participants (Faul, Erdfelder, Buchner, & Lang, 2009). 90 participants (61 female) completed the study during the time we had available for data collection. Participants were on average 22.5 years old (*SD* = 4.49). Participants were paid £5 for their time. Of the participants, 46 were White-European, 18 Indian, 14 East Asian, 4 Black/African, 3 Multiracial, 3 'Other', and 2 Hispanic. Thirty-seven participants were UK citizens, 3 were permanent residents, and 49 were on a UK student visa. Regarding the participants diet, 14 were meat eaters, 33 were omnivores, 20 had limited meat intake, 20 were vegetarian, and 3 were vegan. The average time it took participants to complete the study was 25 minutes.

**8.2.2 Design.** Study 4 was a two-part study. Participants initially completed a short 5-minute survey at home, consisting of our pre-measure of dehumanization. The second part of the study was completed two days after the pre-measure, in the psychology laboratories in 7 George Square, the University of Edinburgh. Participants were given informed consent and then randomly assigned to one of three conditions. All participants completed one of three writing tasks and were then given the dependent measures. Participants were then debriefed and paid. Participants were then asked if they wanted to donate some of their money to a charity and were told it was not part of the study. Participants were then debriefed again and asked if they wanted to know anything about the study, or whether they had any questions about the study.

**8.2.3 Manipulations.** Participants in all three conditions were instructed to take 2 or 3 minutes to write their argument. Participants could move on from the writing task after 2 minutes had passed, there was no maximum time limit for the manipulation.

***Human supremacy.*** The manipulation was the same as in study 3.

***Non-addict supremacy.*** The manipulation was the same as in study 3.

***Control condition.*** The manipulation was the same as in study 3.

**8.2.4 Measures**

The measures were identical to Study 3, with the addition of:

***Fluency and Flexibility coding.*** Fluency and flexibility were taken directly from Goclowska and Crisp (2013). We employed two research assistants to code the written responses for the creativity task, however, only one of the research assistants completed the task, and so we only report the results of one research assistant (RA). The RA was blind to hypotheses and conditions, and study design. The RA was asked to judge: creative fluency – the number of ideas generated by participants in two minutes, and creative flexibility – the number of different categories these ideas belonged to. For example, if someone says that a plastic bottle can be used to hold water, store olive oil, or store vinegar, they have generated three ideas, however, the three ideas are all from the one category – storing liquids. An example of a use for a plastic bottle in a different category would be cutting the top off and a plastic bottle to use as a vase for plants – growing plants.

***Originality coding.*** Originality coding was also taken directly from Goclowska and Crisp (2013). The RA infered oringiality based on how many other participants also gave x idea. For each example participants gave, we computed an originality score using the following equation: 1 – (percentage of participants that generated the same idea/100). We then computed a mean originality score by adding up each originality score for each example, divided by the total number of examples each participant gave. In other words, we made an average originality score for each participant.

***Dehumanization of animals.*** To measure the dehumanization of animals, we used a within sibjects pre and post measure of participants'

attribution of various mental states to animals. We used an existing measure taken from Piazza, Landy, and Goodwin (2014). Specifically, we asked participants to what extent they thought animals were intelligent, clever, inquisitive, creative, can suffer, can experience pain, can experience pleasure, are sophisticated, are sensitive, are powerful, are vigorous, are active, and are energetic. Particpants answered on a 1 (Not at all) – 7 (Extremely) Likert scale, whereby higher numbers equal more attribution of mental states, and lower numbers equal dehumanization of the target group.

***Dehumanization of drug addicts.*** To measure the dehumanization of drug addicts, we used the same within sibjects pre and post measure of participants' attribution of various mental states to animal taken from Piazza, Landy, and Goodwin (2014). Specifically, we asked participants to what extent they thought drug addicts were intelligent, clever, inquisitive, creative, can suffer, can experience pain, can experience pleasure, are sophisticated, are sensitive, are powerful, are vigorous, are active, and are energetic. Particpants answered on a 1 (Not at all) – 7 (Extremely) Likert scale, whereby higher numbers equal more attribution of mental states, and lower numbers equal dehumanization of the target group.

***Dehumanization of Bangladesh workers.*** To measure the dehumanization of Bangladesh sweatshop workers, we used the same within sibjects pre and post measure of participants' attribution of various mental states to animal taken from Piazza, Landy, and Goodwin (2014). Specifically, we asked participants to what extent they thought Bangladesh sweatshop workers were intelligent, clever, inquisitive, creative, can suffer, can experience pain, can experience pleasure, are sophisticated, are sensitive, are powerful, are vigorous, are active, and are energetic. Particpants answered on a 1 (Not at all) – 7 (Extremely) Likert scale, whereby higher numbers equal more attribution of mental states, and lower numbers equal dehumanization of the target group.

***Dehumanization of homeless men.*** To measure the dehumanization of homeless men, we used the same within sibjects pre and post measure of participants' attribution of various mental states to animal taken from Piazza,

Landy, and Goodwin (2014). Specifically, we asked participants to what extent they thought homeless men were intelligent, clever, inquisitive, creative, can suffer, can experience pain, can experience pleasure, are sophisticated, are sensitive, are powerful, are vigorous, are active, and are energetic. Particpants answered on a 1 (Not at all) – 7 (Extremely) Likert scale, whereby higher numbers equal more attribution of mental states, and lower numbers equal dehumanization of the target group.

## 8.3 Results

**8.3.1 Analysis strategy.** We employed both frequentist (using SPSS software) and Bayesian analyses (using JASP software), and ran different models with and without SDO as a covariate. Unlike null hypothesis significance testing, Bayesian model comparison allows for tests in favour of the null hypothesis. Bayesian analyses also allows for model comparison between the null, the covariate, the independent variable, and the independent variable controlling for the covariate. We also ran our main analyses with and without the ethnic minorities and vegetarians/vegans.

**8.3.2 Preliminary data treatment.** We had 102 people sign up to the study. We had 8 people not complete any of the pre-measures, and these participants were deleted, leaving 94 participants. Of those 94 participants, 90 participants completed the written manipulation and the measures of the survey. There were no additional exclusions in this study.

**8.3.3 Missing data.** There were 27 cases of missing data in this study, all of which were participants missing one or two questions. Missing data was transformed to the mean of the scale, as per previous studies.

**8.3.4 Manipulation check.** We visually inspected the written responses of the participants. All participants completed the manipulation correctly, and no participants were removed from analyses.

**8.3.5 Correlational Results.** Please see Table 8.1 for correlations between support for inequalities, feelings of warmth, and SDO in study 4 with frequentist p-values, and Bayes factors. As can be seen in the correlation tables, support for human-animal inequality was only modestly correlated with support for human inequality. Please see Table 8.2 for correlations between

the charitable donations, creativity, support for inequalities, and SDO in study 4. Table 8.3 shows correlations between support for inequalities, SDO, and mind attribution post-test in study 4.

Table 8.1. Showing Pearson correlations, p-values, and Bayes factors between support for inequalities, SDO, Political Orientation, and warmth towards outgroups in study 4.

| Variable | | 1.Human-animal | 2.Drug addict | 3.Bangladesh | 4.Homeless | 5.SDO | 6.PO | 7.Animals warmth | 8.Addicts warmth | 9.Workers warmth |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | r | 0.35 | | | | | | | | |
| | p | < .001 | | | | | | | | |
| | $BF_{10}$ | 82.31 | | | | | | | | |
| 3 | r | 0.40 | 0.69 | | | | | | | |
| | p | < .001 | < .001 | | | | | | | |
| | $BF_{10}$ | 538.96 | 2.05e+11 | | | | | | | |
| 4 | r | 0.34 | 0.71 | 0.70 | | | | | | |
| | p | < .001 | < .001 | < .001 | | | | | | |
| | $BF_{10}$ | 58.58 | 3.24e+12 | 1.04e+12 | | | | | | |
| 5 | r | 0.34 | 0.50 | 0.43 | 0.54 | | | | | |
| | p | < .001 | < .001 | < .001 | < .001 | | | | | |
| | $BF_{10}$ | 52.77 | 6.26e+4 | 2183.83 | 1.01e+6 | | | | | |
| 6 | r | 0.25 | 0.42 | 0.27 | 0.41 | 0.38 | | | | |
| | p | .008 | <.001 | .005 | < .001 | < .001 | | | | |
| | $BF_{10}$ | 4.72 | 1074.45 | 6.92 | 670.75 | 226.68 | | | | |
| 7 | r | -0.25 | -0.19 | -0.23 | -0.15 | -0.28 | -0.04 | | | |
| | p | .009 | .037 | .013 | .082 | .004 | .353 | | | |
| | $BF_{10}$ | 4.00 | 1.22 | 2.94 | 0.62 | 9.10 | 0.18 | | | |
| 8 | r | -0.09 | -0.52 | -0.38 | -0.47 | -0.24 | -0.44 | 0.11 | | |
| | p | .203 | <.001 | <.001 | <.001 | .010 | <.001 | .160 | | |
| | $BF_{10}$ | 0.29 | 1.69e+5 | 235.26 | 1.32e+4 | 3.73 | 3016.51 | 0.36 | | |
| 9 | r | 0.10 | -0.25 | -0.31 | -0.28 | -0.17 | -0.27 | 0.34 | 0.49 | |
| | p | .835 | .009 | .001 | .004 | .059 | .005 | < .001 | < .001 | |
| | $BF_{10}$ | 0.07 | 4.23 | 21.65 | 7.79 | 0.82 | 6.35 | 53.89 | 3.78e+4 | |
| 10 | r | -0.06 | -0.42 | -0.36 | -0.47 | -0.18 | -0.30 | 0.25 | 0.69 | 0.65 |
| | p | .292 | < .001 | < .001 | < .001 | .048 | .002 | .010 | < .001 | < .001 |
| | $BF_{10}$ | 0.22 | 1170.06 | 115.81 | 1.46e+4 | 0.98 | 14.32 | 3.81 | 3.98e+11 | 7.41e+9 |

Note: r = Pearson correlation; p = p-value; $BF_{10}$ = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh, homeless = inequalities; Workers warmth = warmth towards Bangladesh; 10 = warmth towards homeless men.

Table 8.2. Showing Pearson correlations, p-values, and Bayes factors between support for inequalities, charitable donations, and creativity in study 4.

| Variable | | 1.Donation | 2.Fluency | 3.Flexibility | 4.Originality | 5.SDO | 6.Human-animal | 7.Drug addict | 8.Bangladesh |
|---|---|---|---|---|---|---|---|---|---|
| 2 | r | -.03 | | | | | | | |
| | p | .609 | | | | | | | |
| | $BF_{10}$ | .11 | | | | | | | |
| 3 | r | -.01 | .77 | | | | | | |
| | p | .539 | <.001 | | | | | | |
| | $BF_{10}$ | .12 | 2.27e+16 | | | | | | |
| 4 | r | .05 | .19 | .54 | | | | | |
| | p | .305 | .040 | <.001 | | | | | |
| | $BF_{10}$ | .21 | 1.15 | 6.55e+5 | | | | | |
| 5 | r | -.24 | -.06 | -.14 | -.25 | | | | |
| | p | .010 | .272 | .098 | .008 | | | | |
| | $BF_{10}$ | 3.62 | .23 | .54 | 4.51 | - | | | |
| 6 | r | -.14 | .03 | -.04 | .01 | - | | | |
| | p | .097 | .621 | .346 | .519 | - | | | |
| | $BF_{10}$ | .55 | .11 | .19 | .13 | - | | | |
| 7 | r | -.10 | -.06 | -.08 | -.06 | - | | | |
| | p | .170 | .298 | .229 | .292 | - | | | |
| | $BF_{10}$ | .34 | .21 | .27 | .22 | - | | | |
| 8 | r | -.07 | -.13 | -.25 | -.08 | - | | | |
| | p | .257 | .104 | .009 | .218 | - | | | |
| | $BF_{10}$ | .24 | .51 | 3.96 | .28 | - | | | |
| 9 | r | -.16 | .06 | -.07 | -.17 | - | | | |
| | p | .068 | .701 | .265 | .054 | - | | | |
| | $BF_{10}$ | .73 | .09 | .23 | .89 | - | | | |

Note: r = Pearson correlation; p = p-value; $BF_{10}$ = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh, homeless = inequalities; Workers warmth = warmth towards Bangladesh; 10 = warmth towards homeless men.

Table 8.3. Showing Pearson correlations, p-values, and Bayes factors between outgroup mind attribution, SDO, and support for inequalities in study 4.

| Variable | | 1.animal mind | 2.addicts mind | 3.bangladesh mind | 4.homeless mind | 5.SDO | 6.Human-animal | 7.Drug addict | 8.Bangladesh |
|---|---|---|---|---|---|---|---|---|---|
| 2 | r | .35 | | | | | | | |
| | p | <.001 | | | | | | | |
| | $BF_{10}$ | 72.23 | | | | | | | |
| 3 | r | .43 | .66 | | | | | | |
| | p | <.001 | <.001 | | | | | | |
| | $BF_{10}$ | 1755.58 | 1.75e+10 | | | | | | |
| 4 | r | .42 | .78 | .81 | | | | | |
| | p | <.001 | <.001 | <.001 | | | | | |
| | $BF_{10}$ | 1177.92 | 1.35e+17 | 5.31e+19 | | | | | |
| 5 | r | -.07 | -.24 | -.16 | -.18 | | | | |
| | p | .261 | .012 | .065 | .048 | | | | |
| | $BF_{10}$ | .24 | 3.14 | .76 | .97 | | | | |
| 6 | r | -.23 | .05 | -.07 | -.10 | - | | | |
| | p | .014 | .677 | .268 | .169 | - | | | |
| | $BF_{10}$ | 2.75 | 0.09 | 0.23 | .34 | - | | | |
| 7 | r | -.07 | -.34 | -.30 | -.38 | - | | | |
| | p | .257 | <.001 | .002 | <.001 | - | | | |
| | $BF_{10}$ | .24 | 45.41 | 15.56 | 212.05 | - | | | |
| 8 | r | -.10 | -.17 | -.29 | -.32 | - | | | |
| | p | .176 | .058 | .003 | <.001 | - | | | |
| | $BF_{10}$ | .33 | .84 | 11.72 | 31.71 | - | | | |
| 9 | r | -.04 | -.34 | -.26 | -.39 | - | | | |
| | p | .354 | <.001 | .007 | <.001 | - | | | |
| | $BF_{10}$ | .18 | 60.88 | 5.26 | 355.37 | - | | | |

Note: r = Pearson correlation; p = p-value; BF10 = Bayesian support; SDO = Social Dominance Orientation; PO = Political Orientation; Human-animal, Drug addict, Bangladesh, homeless = inequalities; Workers warmth = warmth towards Bangladesh; 10 = warmth towards homeless men.

Support for human-animal inequality was only moderately correlated with SDO, and there was inconclusive evidence that it was associated with political orientation. These results resemble the correlational findings from study 1, and are less similar to the results of study 3. That is, in study 3, support for human-animal inequality was strongly related to support for human inequalities, whereas in study 1 and study 4, and to a lesser extent study 2, support for human-animal inequality was less correlated with support for human inequality.

However, like all previous studies, we again found that support for human inequality were all highly correlated. Moreover, we again did not find support for the correlational foundational hypothesis in that we found support for human inequality to be better predictors of human inequalities than human-animal inequality. Unlike any other of our studies, we found that support for human-animal inequality was only weakly correlated with feelings of warmth towards animals. Participants who had stronger support for human-animal inequality did show more colder feelings towards animals, however, the correlation was only weak, and was not supported by Bayesian analyses.

Feelings of warmth and support for human inequality were all moderately to strongly negatively correlated. That is, participants who more strongly supported the drug addict and homeless inequalities were very likely to also have cold feelings towards drug addicts and homeless men respectively. Participants support for the Bangladesh inequality and feelings of warmth towards Bangladesh workers were only moderately negatively correlated. In other words, participants who more strongly supported the Bangladesh inequality were only weakly more likely to have colder feelings towards Bangladesh workers.

In short, we did not find support for the correlational foundational hypothesis. Similar to all our previous studies, we again found that support for human-animal inequality is correlated with support for human inequalities, however, to a lesser extent than our previous studies. In addition, we again found strong evidence that participants support for various human inequalities

(e.g., drug addict and Bangladesh inequalities) are strongly correlated with each other.

Turning to our new measures, we found that dehumanization of each target group was correlated with the corresponding inequality. For example, the less mind participants attributed to animals, the more participants supported human-animal inequality. In addition, for all the human targets, dehumanization (e.g., of drug addicts) was similarly correlated with support for the corresponding inequality (e.g., the drug addict inequality). However, there was no evidence that the dehumanization of animals was in any way related to support for human inequalities. Similarly, dehumanization of humans did not predict support for human-animal inequality.

Dehumanization of all targets after manipulation were positively correlated, people who attributed a lesser mind to animals, also attributed a lesser mind to drug addicts, homeless men, and sweatshop workers. In line with our consistent findings that support for human-animal inequality was not asymmetrically correlated with support for human inequalities, in study 4 we found that dehumanization of animals after the manipulation was not asymmetrically related to dehumanization of human targets. In fact, like support for human inequalities, dehumanization of human target groups after the manipulation were strongly correlated.

In addition, donation to a charity (either the human or animal charity) was negatively correlated with SDO, and positively correlated with mind attribution of both humans and animals after the manipulation. Moreover, our measure of creativity revealed that creative fluency was strongly correlated with creative flexibility – the more examples of uses participants gave for plastic bottles (fluency) the more likely they were to give multiple categories of uses (flexibility). The number of examples (fluency) was only correlated weakly with originality – participants who wrote more examples of uses for a plastic bottle were not more likely to give more original ideas. In addition, people who were more likely to give different categories of uses of plastic bottles (flexibility) were also more likely to give more original ideas (originality). In addition, none of our creativity measures correlated with support for human-animal inequality,

or dehumanization of animals. Creativity was also unrelated to support for human inequality, with the exception that creative flexibility was weakly negatively correlated with support for the Bangladesh inequality. In addition, creative originality was weakly negatively correlated with SDO. However, the creativity results overall reveal that creativity is unrelated to support for inequalities, and dehumanization of both animals and humans.

**8.3.6 Experimental Results.** To examine the impact the manipulations had on the dependent variables, we ran multiple ANOVAs, with and without controlling for SDO as a covariate. We also examined the Bayesian model comparison with and without vegetarians and vegans, to see whether the effects remained for omnivores.

***Human-animal inequality.*** See Figure 8.1 below for the mean level of support for human-animal inequality. To examine the impact that the manipulations had on the support for human-animal inequality, we ran an ANOVA which revealed no main effect of condition, $F(2, 87), = 0.47$, $p = .627$, $\eta_p^2 = 0.01$, $BF_M = 0.01$. Levene's test of homogeneity of variance was not violated, $F(2, 87) = .85$, $p = .432$. When entering SDO into the model, SDO was a significant covariate, $F(1, 86), = 10.56$, $p = .002$, $\eta_p^2 = 0.11$, $BF_M = 19.70$, but the overall model remained non-significant, $F(2, 86), = 0.15$, $p = .862$, $\eta_p^2 = 0.00$, $BF_M = 0.33$.

Bayesian model comparison revealed good support for SDO best predicting support for human-animal inequality. Bayesian model comparison also revealed inconclusive evidence against the null model predicting support for human-animal inequality, $BF_M = 0.09$. We did not have the power to remove the 23 vegetarians from analyses.

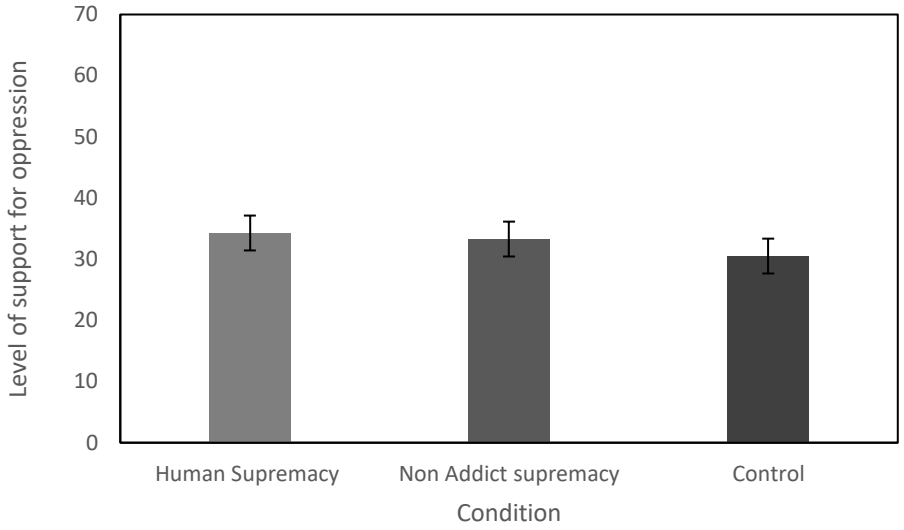


*Figure 8.1.* Showing no difference in the mean level of support for human-animal inequality between conditions. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards animals.*** We ran a similar ANOVA model to examine any differences in perceptions of warmth towards animals. See Figure 8.2 below for the mean feelings of warmth towards animals per condition. The results revealed no difference in feelings of warmth towards animals between conditions, $F(2, 87) = .61$, $p = .547$, $\eta_p^2 = 0.01$, $BF_M = 0.07$. Levene's test of homogeneity of variance was not significant, $F(2, 87) = .381$, $p = .684$. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 86) = 7.00$, $p = .010$, $\eta_p^2 = .08$, $BF_M = 8.71$, and the overall model remained non-significant, $F(2, 86) = 0.42$, $p = .660$, $\eta_p^2 = .01$, $BF_M = .35$. Further, Bayesian model comparison showed inconclusive evidence for the null model, $BF_M = 0.45$. Together, Bayesian model comparison suggests individual differences in SDO best predict warmth towards animals.

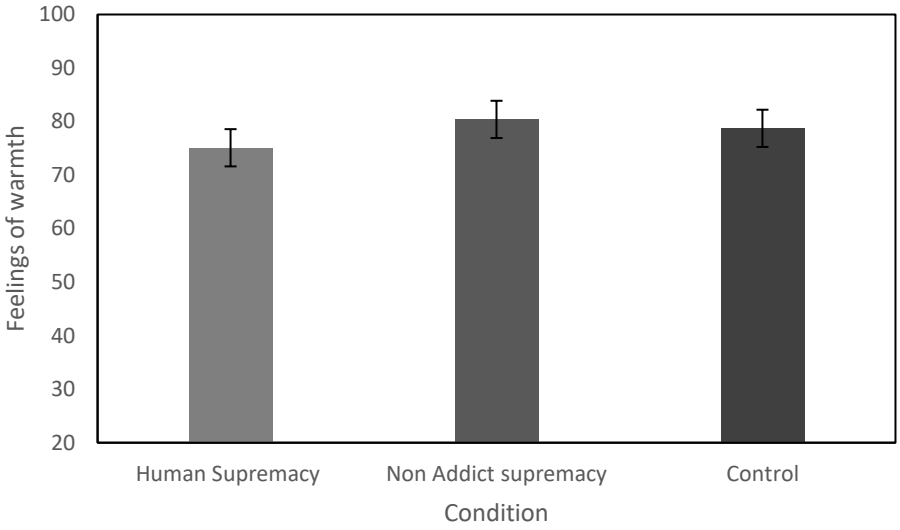


*Figure 8.2.* Showing no difference in the mean feelings of warmth towards animals between conditions. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Dehumanization of animals.*** We conducted a mixed model ANOVA, with repeated measures on mind attribution, and condition as a between subjects factor, to test for any differences in dehumanization of animals. We found there was a significant interaction between time and condition, $F(2, 81)$, = 3.47, $p$ = .036, $\eta_p^2$ = 0.08. We broke down the interaction by computing separate one-way ANOVAs on the dehumanization of animals, before and after the manipulation. An ANOVA revealed there was no difference in dehumanization of animals before the manipulation, $F(2, 83)$, = 0.55, $p$ = .578, $\eta_p^2$ = 0.01. A second ANOVA revealed a significant difference in dehumanization of animals after the manipulation, whereby participants that challenged human supremacy (M = 5.77, SE = 0.14), attributed significantly more mind to animals than control participants (M = 5.22, SE = 0.14), $F(2, 89)$, = 3.85, $p$ = .025, $\eta_p^2$ = 0.08. There were no other significant differences between conditions.

There was also a main effect of time, such that all participants attributed more mind to animals after the manipulation (M = 5.47, SE = 0.08) than before (M = 5.18, SE = 0.10), $F(1, 81)$, = 28.36, $p$ < .001, $\eta_p^2$ = 0.26. There was no main effect of condition, overall participants attributed a similar level of mind to animals between conditions, $F(1, 81)$, = 1.70, $p$ = .188, $\eta_p^2$ = 0.04. Please see

Figure 8.3 below for the means and standard errors of the dehumanization of animals per condition, before and after the manipulation.

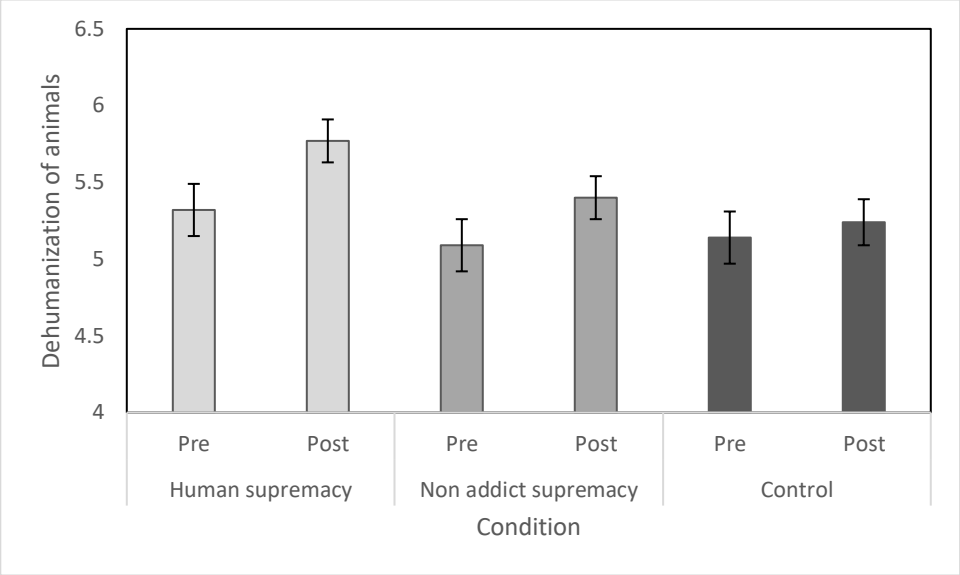


*Figure 8.3.* Showing participants in the human supremacy is arbitrary condition showed a decrease in dehumanization of animals after the manipulation. There was no significant difference in dehumanization after the manipulation for the non-addict supremacy or control conditions. Higher numbers equal *more* mind; lower numbers equal *more* dehumanization. Error bars are +/- 1 standard error.

***Drug addict inequality.*** To examine the impact that the manipulations had on the support for the drug addict inequality, we ran an ANOVA which revealed a significant main effect of condition, $F(2, 87), = 6.76$, $p = .002$, $\eta_p^2 = 0.13$, $BF_M = 3.03e\ 58$. See figure 8.4 below for the mean level of support for the drug addict inequality. Levene's test of homogeneity of variance was not violated, $F(2, 87) = 1.52$, $p = .223$. When entering SDO into the model, SDO was a significant covariate, $F(1, 86), = 33.13$, $p < .001$, $\eta_p^2 = 0.28$, $BF_M = 0.04$, and the overall remained significant with very strong support from Bayesian analyses, $F(2, 86), = 8.61$, $p < .001$, $\eta_p^2 = 0.17$, $BF_M = 218.07$.

Bayesian model comparison revealed weak support for SDO alone, and very strong support for the interaction between condition and SDO predicting support for the drug addict inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M = 1.62e\ -6$) predicting support for the drug addict inequality.

Post-hoc comparisons with Bonferoni adjustments for multiple comparisons revealed that participants in the drug addicts condition (M = 13.55, SD = 14.95) supported the drug addict inequality significantly less than either the human supremacy (M = 30.12, SD = 18.85, $p$ = .001, $BF_{10,U}$ = 69.76), or control conditions (M = 25.52, SD = 19.89, $p$ = .003, $BF_{10,U}$ = 4.44). As can be seen, the Bayesian post hoc comparisons revealed very strong support for the difference between the human supremacy and the non-addict supremacy conditions, and moderate evidence for the difference between the non-addict supremacy and the control conditions. The difference between the human supremacy and control conditions was not significant ($p$ = 1.00, $BF_{10,U}$ = 0.37).

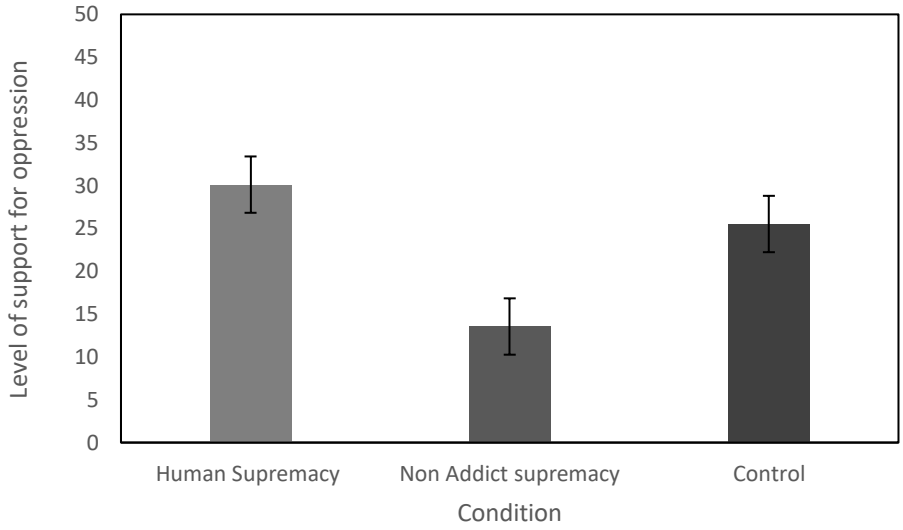


*Figure 8.4.* Showing participants in the non-addict supremacy condition revealed significantly less support for the drug addict inequality than the human supremacy and control conditions. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Warmth towards drug addicts.*** We ran an ANOVA to examine any differences in perceptions of warmth towards drug addicts. See Figure 8.5 below for the mean feelings of warmth towards drug addicts per condition. The results revealed a significant difference in feelings of warmth towards drug addicts between conditions, $F(2, 87) = 2.48$, $p$ = .090, $\eta_p^2$ = 0.05, $BF_M$ = 0.41. Levene's test of homogeneity of variance was not significant, $F(2, 87) = .35$, $p$ = .705. When controlling for SDO, an ANCOVA showed SDO was a significant covariate $F(1, 86) = 5.05$, $p$ = .027, $\eta_p^2$ = .06, $BF_M$ = 2.28, and the overall model became non-significant, $F(2, 86) = 2.24$, $p$ = .113, $\eta_p^2$ = .05, $BF_M$ = 1.14. Further,

Bayesian model comparison showed inconclusive evidence for the null model, $BF_M$ = 0.40. Together, Bayesian model comparison suggests individual differences in SDO best predict warmth towards drug addicts.

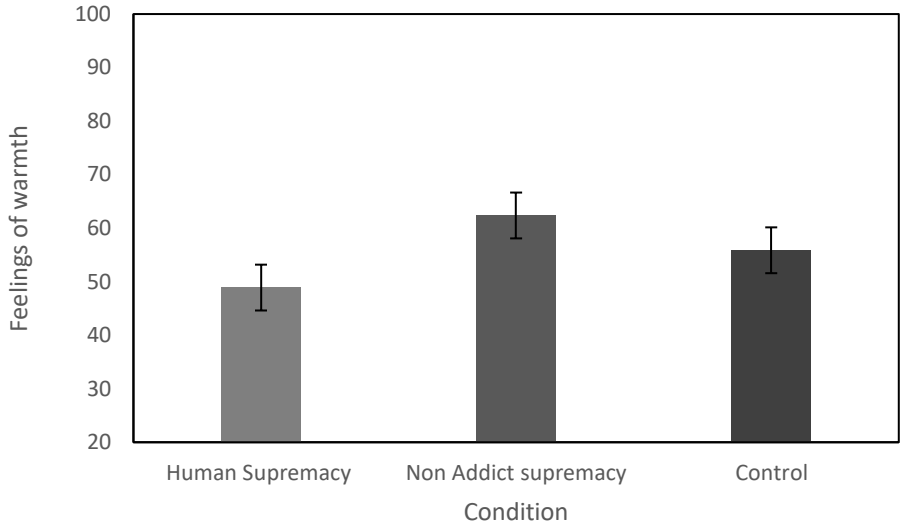


*Figure 8.5.* Showing participants in the non-addict supremacy condition displaying higher feelings of warmth towards drug addicts than the human supremacy and control conditions. Note: this effect was reduced to non-significance when controlling for individual differences in SDO. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Dehumanization of drug addicts.*** We conducted a mixed model ANOVA, with repeated measures on mind attribution, and condition as a between subjects factor, to test for any differences in dehumanization of drug addicts. We found there was no significant interaction between time and condition, $F(2, 81)$, = 1.04, $p$ = .358, $\eta_p^2$ = 0.03. However, there was a main effect of time whereby all participants attributed more mind to drug addicts after the manipulation (M = 4.74, SE = 0.10) than before (M = 4.59, SE = 0.09), $F(1, 81)$, = 4.60, $p$ = .035, $\eta_p^2$ = 0.05. There was no main effect of condition on dehumanization of drug addicts, $F(2, 81)$, = 1.07, $p$ = .348, $\eta_p^2$ = 0.03. Please see Figure 8.6 below for the means and standard errors of the dehumanization of drug addicts per condition, before and after the manipulation.

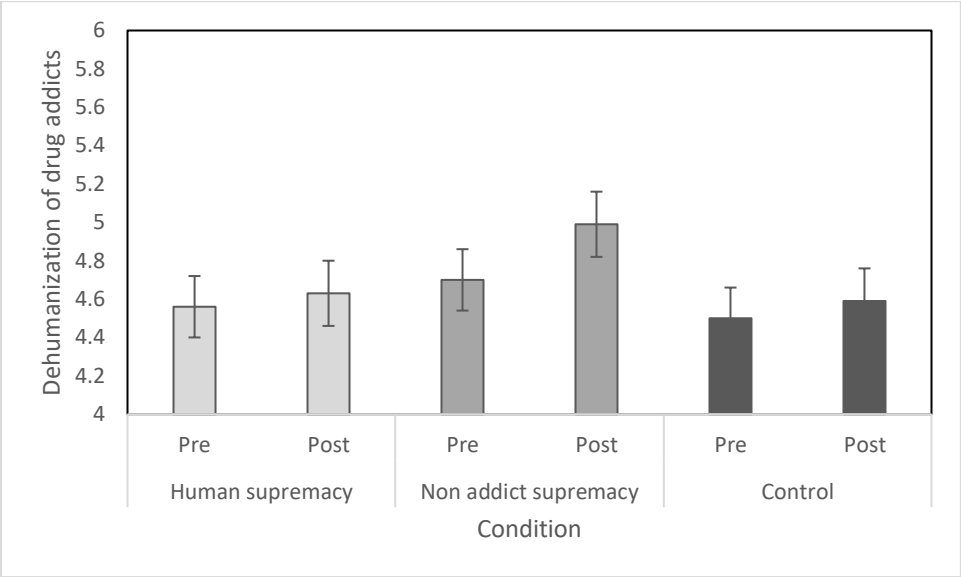


*Figure 8.6.* Showing dehumanization of drug addicts pre and post manipulation, between conditions. Higher numbers equal more mind, lower numbers equal more dehumanization. Error bars are +/- 1 standard error.

***Bangladesh inequality.*** Levene's test of homogeneity of variance was violated, $F(2, 87) = 7.58$, $p < .001$. To examine the impact that the manipulations had on the support for the Bangladesh inequality, we ran a Welch's ANOVA which showed no main effect of condition, $F(2, 55.18), = 2.27$, $p = .113$, $\eta_p^2 = 0.05$, $BF_M = 0.00$. See figure 8.7 below for the mean level of support for the Bangladesh inequality per condition. When entering SDO into the model, SDO was a significant covariate, $F(1, 86), = 20.08$, $p < .001$, $\eta_p^2 = 0.19$, $BF_M = 5.73$, and the overall model remained non-significant, $F(2, 86), = 2.08$, $p = .131$, $\eta_p^2 = 0.05$, $BF_M = 1.56$.

To sum, Bayesian model comparison revealed SDO was the best predictor of support for the Bangladesh inequality, and inconclusive support for the interaction between condition and SDO predicting support for the Bangladesh inequality. Bayesian model comparison also revealed evidence against condition alone, or the null model ($BF_M = 0.00$) predicting support for the Bangladesh inequality.

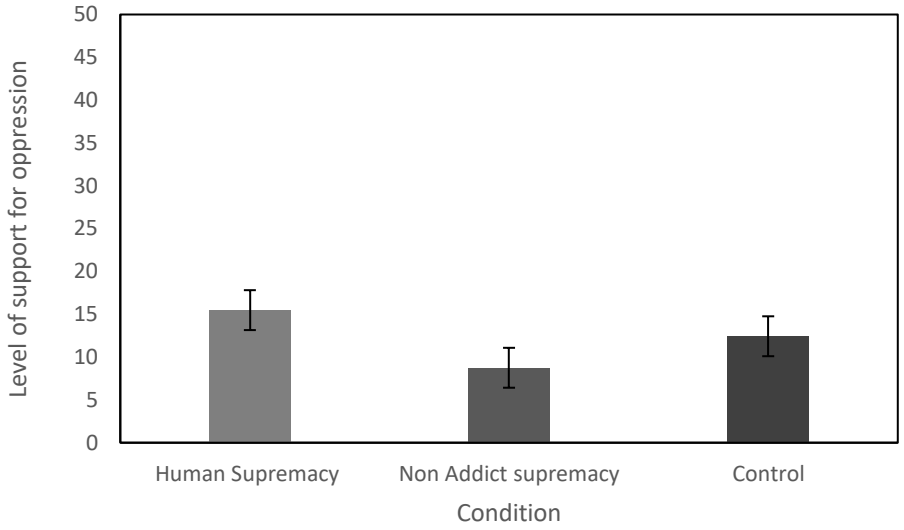


*Figure 8.7.* Showing no significant difference in the mean level of support for the Bangladesh inequality between conditions. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards Bangladesh sweatshop workers.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards Bangladesh sweatshop workers See Figure 8.8 below for the mean feelings of warmth towards Bangladeshi workers per condition. The results revealed no difference in feelings of warmth towards Bangladesh sweatshop workers between conditions, $F(2, 87) = 2.01$, $p = .140$, $\eta_p^2 = 0.04$, $BF_M = 0.73$. Levene's test of homogeneity of variance was not significant, $F(2, 87) = .12$, $p = .887$. When controlling for SDO, an ANCOVA showed SDO was not a significant covariate $F(1, 86) = 2.60$, $p = .110$, $\eta_p^2 = .03$, $BF_M = 1.07$, and the overall model remained non-significant, $F(2, 86) = 2.08$, $p = .131$, $\eta_p^2 = .05$, $BF_M = 0.47$. Further, Bayesian model comparison showed inconclusive evidence for the null model, $BF_M = 2.04$. Together, Bayesian model comparison showed inconclusive results when predicting warmth towards Bangladesh sweatshop workers. In short, neither SDO nor condition predicted warmth towards Bangladesh sweatshop workers.

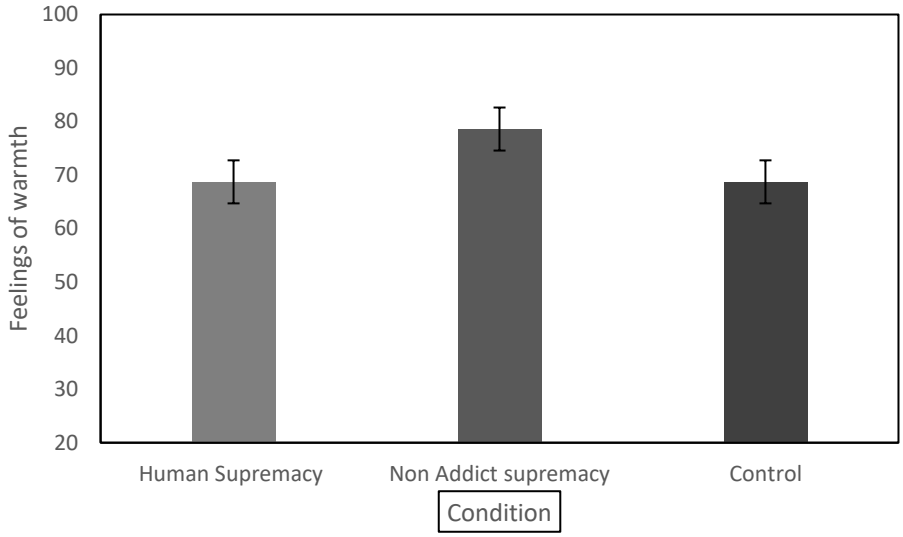


*Figure 8.8.* Showing no significant differences in the mean feelings of warmth towards Bangladesh workers between conditions. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Dehumanization of Bangladesh workers.*** We conducted a mixed model ANOVA, with repeated measures on mind attribution, and condition as a between subjects factor, to test for any differences in dehumanization of Bangladesh sweatshop workers. We found there was no significant interaction between time and condition, $F(2, 83) = 0.41$, $p = .666$, $\eta_p^2 = 0.01$. However, there was again a main effect of time whereby all participants attributed more mind to Bangladesh sweatshop workers after the manipulation (M = 5.16, SE = 0.08) than before (M = 5.03, SE = 0.08), $F(1, 83) = 6.83$, $p = .011$, $\eta_p^2 = 0.08$. In addition, there was a significant main effect of condition, whereby participants in the non-addict supremacy (M = 5.38, SE = 0.13) attributed significantly more mind to Bangladesh workers than controls (M = 4.85, SE = 0.14), $F(2, 83) = 4.02$, $p = .022$, $\eta_p^2 = 0.09$. No other pairwise comparisons were significant; please see Figure 8.9 below for the means and standard errors of the dehumanization of Bangladesh workers per condition, before and after the manipulation.

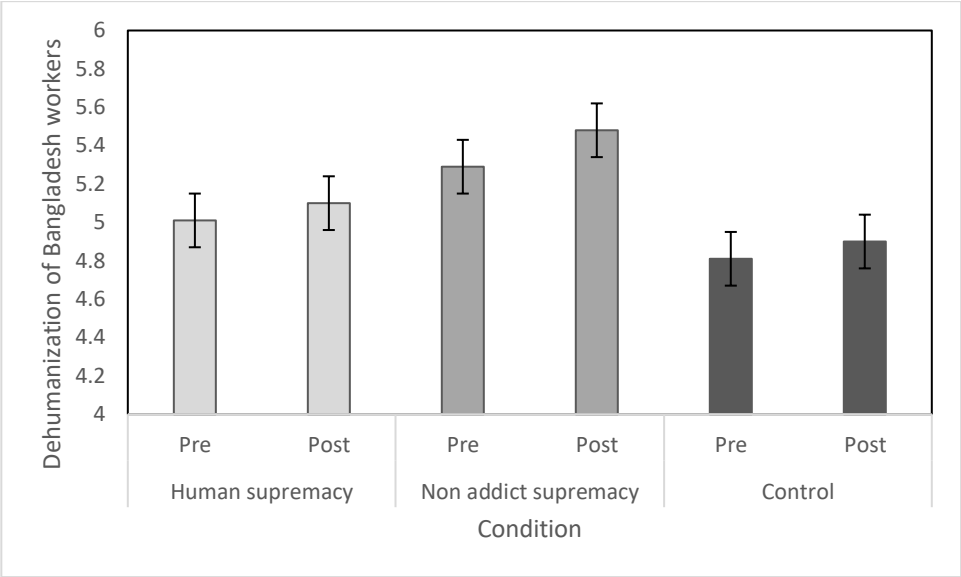


*Figure 8.9.* Showing no interaction of time and condition on dehumanization of Bangladesh workers; Main effect of time whereby all participants attributed a significantly more mind to Bangladesh workers after the manipulation; participants in the non-addict supremacy condition showed overall less dehumanization of Bangladesh workers than controls. Higher numbers equal more mind, lower numbers equal more dehumanization. Error bars are +/- 1 standard error.

***Homeless inequality.*** To examine the impact that the manipulations had on the support for the Homeless inequality, we ran an ANOVA which showed no main effect of condition, $F(2, 87)$, = 1.46, $p$ = .238, $\eta_p^2$ = 0.03, $BF_M$ =1.80e - 6. See figure 8.10 below for the mean level of support for the homeless inequality per condition. Levene's test of homogeneity of variance was not violated, $F(2, 87) = 0.94$, $p$ = .396 When entering SDO into the model, SDO was a significant covariate, $F(1, 86)$, = 37.33, $p < .001$, $\eta_p^2$ = 0.30, $BF_M$ =7.28, and the overall model improved but remained non-significant, $F(2, 86)$, = 1.82, $p$ = .169, $\eta_p^2$ = 0.04, $BF_M$ =1.24.

Bayesian model comparison revealed evidence for SDO predicting support for the Homeless inequality, and inconclusive support for the interaction between condition and SDO predicting support for the Homeless inequality. Bayesian model comparison also revealed very strong evidence against condition alone, or the null model ($BF_M$ = 5.72e -6) predicting support for the Homeless inequality.

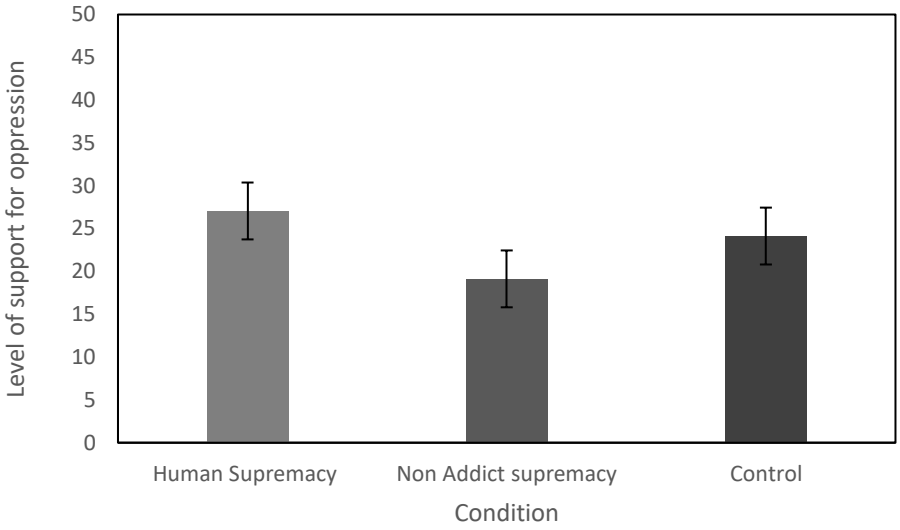


*Figure 8.10.* Showing no significant difference in the mean level of support for the homeless inequality between conditions. Higher numbers equal more support. Error bars are +/- 1 standard error.

***Warmth towards homeless men.*** We ran another ANOVA model to examine any differences in perceptions of warmth towards homeless men. See Figure 8.11 below for the mean feelings of warmth towards homeless men per condition. The results revealed a marginally significant difference in feelings of warmth towards homeless men between conditions, $F(2, 87) = 3.08$, $p = .051$, $\eta_p^2 = 0.07$, $BF_M = 1.23$. Levene's test of homogeneity of variance was not significant, $F(2, 87) = 0.05$, $p = .947$. When controlling for SDO, an ANCOVA showed SDO was a marginally significant covariate $F(1, 86) = 3.14$, $p = .080$, $\eta_p^2 = .04$, $BF_M = 0.74$, and the overall model became significant, $F(2, 86) = 3.24$, $p = .044$, $\eta_p^2 = .07$, $BF_M = 1.00$. Further, Bayesian model comparison showed inconclusive evidence for the null model, $BF_M = 1.06$. Together, Bayesian model comparison provided inconclusive evidence for feelings of warmth towards homeless men in the UK.

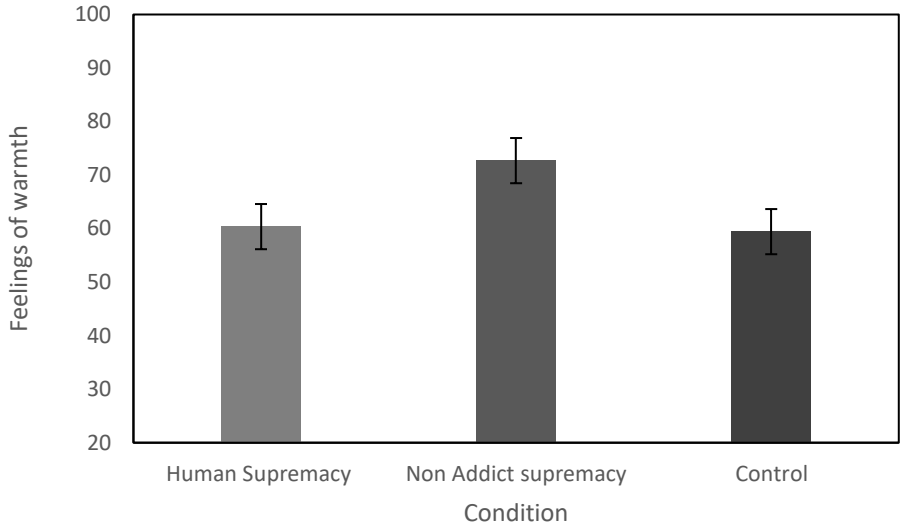


*Figure 8.11.* Showing participants in the non-addict condition displaying higher feelings of warmth towards homeless men than the human supremacy and control conditions, however, this effect was not supported with Bayesian analyses. Higher numbers equal more warmth. Error bars are +/- 1 standard error.

***Dehumanization of homeless men.*** We conducted a mixed model ANOVA, with repeated measures on mind attribution, and condition as a between subjects factor, to test for any differences in dehumanization of homeless men. We found there was no significant interaction between time and condition, $F(2, 82) = 1.10$, $p = .338$, $\eta_p^2 = 0.03$. However, there was again a main effect of time whereby all participants attributed more mind to homeless men after the manipulation (M = 4.72, SE = 0.09) than before (M = 4.50, SE = 0.10), $F(1, 82) = 11.47$, $p = .001$, $\eta_p^2 = 0.12$. In addition, there was also a significant main effect of condition, whereby participants in the non-addict supremacy (M = 4.91, SE = 0.15) attributed significantly more mind to homeless men than controls (M = 4.33, SE = 0.15), $F(2, 82) = 3.68$, $p = .030$, $\eta_p^2 = 0.08$. No other pairwise comparisons were significant; please see Figure 8.12 below for the means and standard errors of the dehumanization of homeless men per condition, before and after the manipulation.

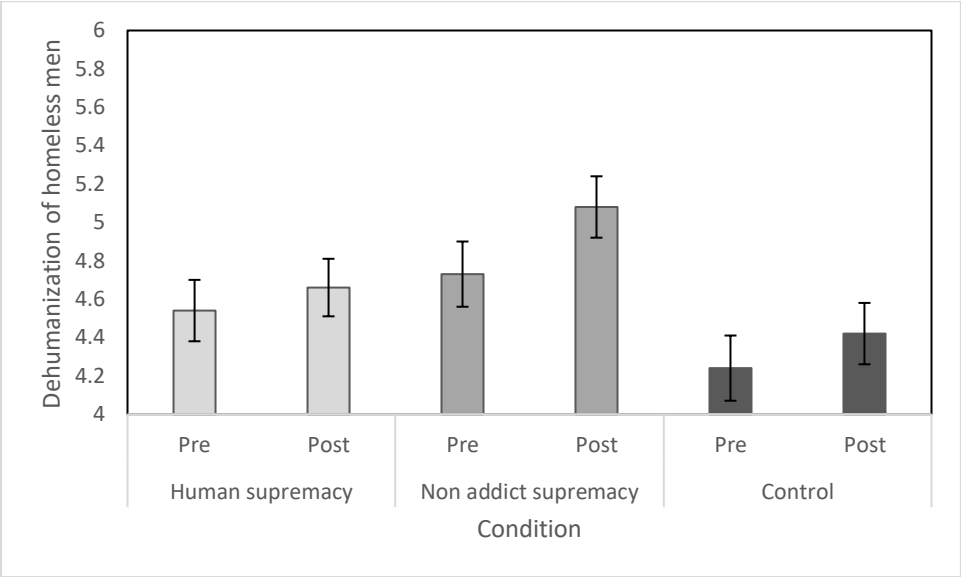


*Figure 8.12.* Showing no significant interaction between time and condition on dehumanization of homeless men; a main effect of time whereby all participants showed less dehumanization (more mind) after the manipulation; the non-addict supremacy condition displayed overall more mind attribution towards homeless men than controls. Higher numbers equal more mind, lower numbers equal more dehumanization. Error bars are +/- 1 standard error.

***Charitable donations.*** Participants were asked to donate money to either Action on Addiction (a drug addiction charity), or the Scottish SPCA (an animal welfare charity). Participants in the human supremacy condition were asked whether they would donate to Action on Addiction, whereas participants in the non-addict supremacy condition were asked whether they wanted to donate to the Scottish SPCA. The purpose of this was to test the foundational hypothesis. More specifically, we wanted to see whether challenging human supremacy would have an impact on donations to an animal welfare charity (compared to controls), and we wanted to see whether challenging human-animal supremacy would have an impact on donations to a human charity (compared to controls).

To examine the impact of our manipulations on the donations given to charity we first conducted an ANOVA condition predicting charitable donations. Homogeneity of variance was violated, $F(2, 87) = 3.58$, $p = .031$. A Welch's ANOVA revealed a significant effect of condition on charitable donations whereby participants in the non-addict condition ($M$ = £0.71, $SD$ = £0.73) donated less of their study earnings to a charity, compared to both participants in the human supremacy ($M$ = £1.34, $SD$ = £1.45) and control conditions ($M$ =

£1.28, *SD* = £1.38), *F*(2, 52.08) = 3.54, *p* = .036, $\eta_p^2$ = .05, $BF_M$ = 0.38. When entering SDO into the model, SDO was a significant covariate, *F*(1, 86) = 6.05, *p* = .016, $\eta_p^2$ = .07, $BF_M$ = 2.00, and the overall model became non-significant, *F*(2, 86) = 2.72, *p* = .071, $\eta_p^2$ = .06, $BF_M$ =1.43. Please see Figure 8.13 below for the amount of charitable donations per condition. Bayesian model comparison also revealed inconclusive evidence for the null model, $BF_M$ = 0.59. Overall, Bayesian analyses provided inconclusive evidence for all models.

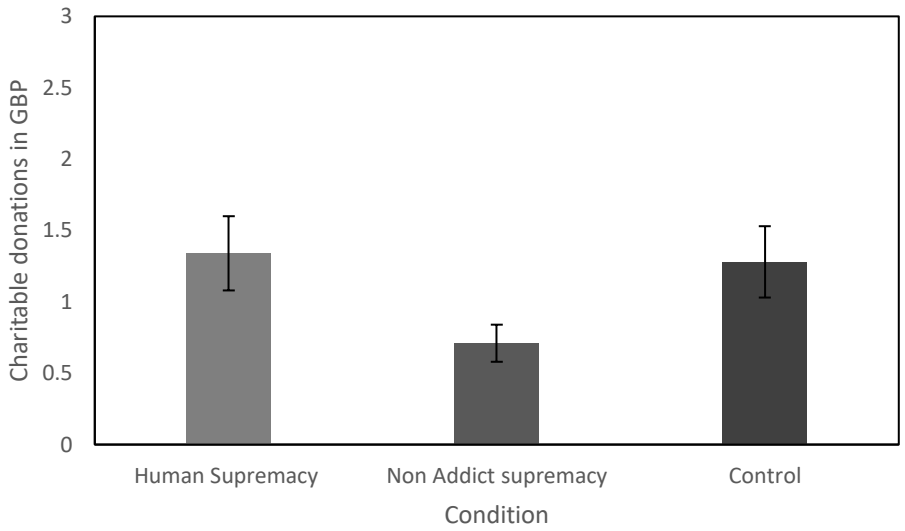


*Figure 8.13.* Showing participants in the non-addict supremacy condition giving less to charity than the human supremacy and control conditions condition, however, this effect was reduced to non-significance when including SDO in the model. Error bars are +/- 1 standard error.

We then wanted to test whether overall participants donated more to the human or the animal charity. A between subjects t-test revealed that irrespective of condition, participants donated more money on average to the drug addiction charity (*M* = £1.38, *SD* = £1.41) than to the animal welfare charity (*M* = £0.84, *SD* = £1.01), *t*(79.92) = 2.11, *p* = .038, 95%CI [-1.06, -.03]. However, this difference was not significant when adjusting for Bonferoni multiple comparisons, nor had support from Bayesian analyses, $BF_{10}$ = 1.52. Taken together, there is no frequentist or Bayesian evidence that participants donated more money to the human charity than the animal charity.

Next, we wanted to compare whether participants in the human supremacy conditions donated more money to the drug addiction charity

Action on Addiction than participants in the control condition who donated to Action on Addiction. We also wanted to compare whether participants in the non-addict supremacy conditions donated more money to the animal welfare charity the Scottish SPCA than participants in the control condition who also donated to the Scottish SPCA. To make these comparisons we conducted two t-tests.

A t-test between participants in the human supremacy condition and the control condition (who were asked to donate to Action on Addiction) revealed no difference in donations, $t(43) = .19$, $p = .848$, 95%CI [-.98, .81]. Participants in the human supremacy ($M$ = £1.34, $SD$ = £1.45) and the control condition (who were asked to donate to Action on Addiction) ($M$ = £1.34, $SD$ = £1.45) donated a similar amount of their study earnings to the drug addiction charity Action on Addiction.

A t-test between participants in the non-addict supremacy condition and the control condition (who were asked to donate to the Scottish SPCA) revealed no significant difference $t(16.09) = .97$, $p = .347$, 95%CI [-1.28, .48] (*df* adjustments made for violation of homogeneity of variance). Participants in the non-addict supremacy ($M$ = £0.71, $SD$ = £0.73) and the control condition (who were asked to donate to the Scottish SPCA) ($M$ = £1.11, $SD$ = £1.47) donated a similar amount of their study earnings to the animal welfare charity the Scottish SPCA.

***Creative Fluency.*** To examine whether there were any differences in the amount of creative uses for a plastic bottle, we ran an ANOVA which revealed no difference between conditions, $F(2, 89) = 0.47$, $p = .624$, $\eta_p^2 = .01$, $BF_M = 0.33$. Levene's test was not significant, $F(2, 87) = 0.02$, $p = .977$, and SDO was not a significant covariate, $F(1, 89) = 0.47$, $p = .496$, $\eta_p^2 = .01$, $BF_M = 0.66$. Please see Figure 8.14 for uses for a plastic water bottle generated in two minutes (creative fluency). In short, participants in all conditions gave a similar number of examples of uses for plastic bottles. In addition, Bayesian model comparison provide good evidence for the null model, $BF_M = 6.77$.

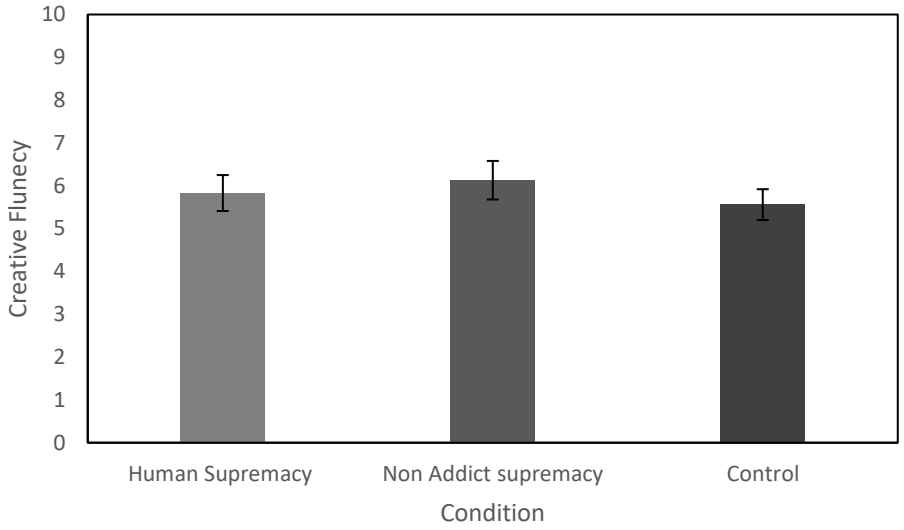


*Figure 8.14.* Showing no difference in the amount of uses for a plastic water bottle generated in two minutes (creative fluency) between conditions. Error bars are +/- 1 standard error.

***Creative Flexibility.*** To examine whether there were any differences in the amount of creative categories people gave examples of, we ran an ANOVA which revealed no difference between condition, $F(2, 87) = 0.40$, $p = .673$, $\eta_p^2 = .01$, $BF_M = 0.27$. Levene's test was not significant, $F(2, 87) = 0.56$, $p = .576$, and SDO was not a significant covariate, $F(1, 86) = 2.00$, $p = .161$, $\eta_p^2 = .02$, $BF_M = 1.12$. Please see Figure 8.15 for the amount of different categories of uses for a plastic water bottle generated in two minutes (creative flexibility). In short, participants in all conditions gave a similar number of examples of uses for plastic bottles. In addition, Bayesian model comparison also provided good evidence for the null model, $BF_M = 4.47$.

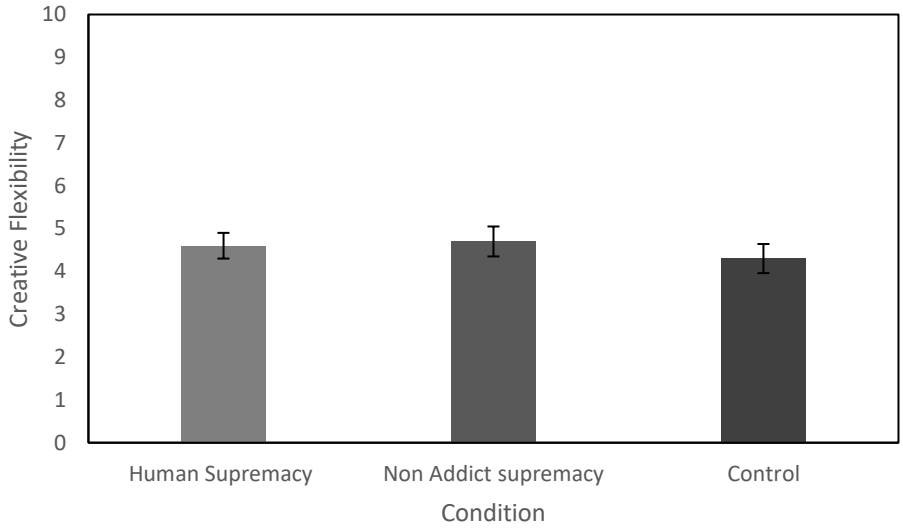


*Figure 8.15.* Showing no difference in the amount of different categories of uses for a plastic water bottle generated in two minutes (creative flexibility) between conditions. Error bars are +/- 1 standard error.

***Creative Originality.*** To examine whether there were any differences in the originality of the examples people gave for uses of a plastic water bottle, we ran an ANOVA which revealed no difference between condition, $F(2, 87) = 1.24$, $p = .296$, $\eta_p^2 = .03$, $BF_M = 0.15$. Levene's test was not significant, $F(2, 87) = 0.40$, $p = .674$. SDO was a significant covariate, $F(1, 86) = 7.47$, $p = .008$, $\eta_p^2 = .08$, $BF_M = 3.48$, but the overall model remained non-significant, $F(2, 86) = 1.99$, $p = .143$, $\eta_p^2 = .04$, $BF_M = 0.92$. In addition, Bayesian model comparison also provided inconclusive evidence for the null model, $BF_M = 0.66$. Please see Figure 8.16 for the average originality score of uses for a plastic water bottle generated in two minutes. In short, individual differences in SDO best predicted the average originality of the examples participants gave for uses of a plastic bottle.

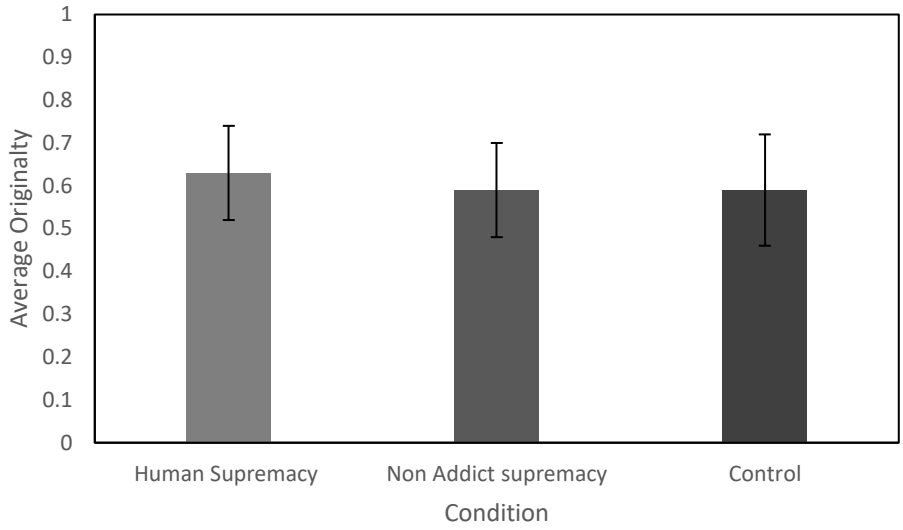


*Figure 8.16.* Showing no difference in the average originality score of uses for a plastic water bottle generated in two minutes between conditions. Error bars are +/- 1 standard error.

## 8.4 Discussion

**8.4.1 Correlational Results.** The correlational results supported both our correlational hypotheses. Support for human-animal inequality is strongly correlated with support for all three human inequalities measured. That is, supporting our first correlational hypotheses, the attitudes towards all four inequalities (human-animal, drug addict, Bangladesh, homeless) were all positively correlated. In addition, corroborating study 3, support for the homeless inequality was strongly related to both human-animal and human inequalities.

Once again, SDO was correlated with support for human-animal inequality. However, SDO was more strongly correlated with support for the human inequalities than human-animal inequality. Conservative political orientation was correlated positively with support for human-animal inequality, but like SDO was more strongly correlated with attitudes towards the human inequalities than human-animal inequality.

In addition, and supporting our hypotheses, human-animal inequality was not foundational to other inequalities. That is, human inequality were correlated more strongly with each other than with human-animal inequality. As expected, support for the homeless and drug addicts inequality were very strongly correlated. Unexpectedly, support for the homeless and Bangladesh

inequalities were also very strongly correlated. Departing from study 3 and in line with studies 1 and 2, attitudes towards human-animal inequality were only moderately correlated with support for all the human inequalities.

To sum, we again found evidence that support for human-animal inequality is correlated with support for human inequalities. However, support for human-animal inequality is not asymmetrically correlated to support for human inequalities. That is, support for human inequalities is best predicted by support for other human inequalities.

Our new measure of charitable donations was correlated negatively with SDO (e.g., the higher the SDO, the less likely to donate to either charity), however charitable donations were unrelated to support for the human-animal or human inequalities. In addition, our measures of creativity revealed that SDO was unrelated to creative fluency (number of examples) and creative flexibility (number of categories of examples), but was significantly negatively correlated with creative originality (how original or unique the examples were). In other words, people higher in SDO tended to write less original or unique ideas compared to low SDO people.

Further, the creativity measures were uncorrelated with support for inequalities, except for a small negative correlation between creative flexibility and support for the Bangladesh inequality. That is, participants who gave more examples of different uses for a plastic bottle were less likely to support the Bangladesh inequality. Importantly, we found no other significant correlations between creativity and support for inequalities. In short, there is no good evidence that creativity is correlated with support for either human-animal or human inequalities.

### 8.4.2 Experimental Results

***Human-animal inequality*.** Participants endorsed human-animal inequality more than any of human inequality. We found no difference in support for human-animal inequality between conditions. This effect persisted when controlling for individual differences in SDO. In addition, we found good evidence that challenging non-addict supremacy did not have a downstream effect for reducing endorsement of human-animal inequality. However, we did

find a significant increase in mind attributed to animals after the human supremacy manipulation, compared to the control condition (there was no significant difference between the human supremacy and non-addict supremacy conditions). We did not have the power to exclude the vegetarians from analyses, and so based off the results from study 3, it is likely that the effects of the manipulations are less effective for meat eaters than they are for vegetarians who tend to have more moral concern for animals.

***Drug addict inequality.*** We found a main effect of condition in the endorsement of the drug addict inequality. We found that participants who had just written a paragraph arguing that non-addicts are not superior to drug addicts showed significantly less endorsement of the drug addict inequality than both participants in the human supremacy and control conditions. We also found no difference in endorsement of the drug addict inequality between participants in the human supremacy condition and controls. Bayesian analyses provided additional evidence that the interaction between condition and SDO best predicted support for the drug addict inequality. Bayesian analyses also revealed very strong evidence against the null model. Given the results of study 3, it is possible that these results would be less pronounced when excluding vegetarians, however, we did not have the power to analyse the data without vegetarians.

Turning to the results of the dehumanization of drug addicts, while there was a trend for participants in the non-addict supremacy condition to attribute more mind to drug addicts, there was no significant difference. It is interesting then that participants in the non-addict supremacy condition supported the drug addict inequality less than the participants in the other conditions, but did not show a significant reduction in dehumanization. However, this finding is less surprising when taken alongside the only moderate relationship between dehumanization of drug addicts and support for the drug addict inequality, as evidenced in the correlational results of this section. In other words, because dehumanization and support for a inequality are two different things, it is possible that the manipulation is able to shift one (e.g., support for the drug addict inequality), and not the other (e.g., the dehumanization of drug addicts).

In addition, a larger sample size would have been able to provide clearer evidence for these findings, however, we were unable to do so due to time constraints.

***Bangladesh inequality*.** Like previous studies, all participants revealed a low level of support for the Bangladesh inequality. There was no main effect of condition, and there was inconclusive evidence for an SDO x condition interaction. Taken together, there was good evidence that SDO alone best predicted support for the Bangladesh inequality. Turning to dehumanization of Bangladesh sweatshop workers, we found that participants in the non-addict supremacy condition attributed significantly more mind to Bangladesh sweatshop workers than control participants, but not participants in the human supremacy condition. This finding suggests that it is possible that challenging supremacy over drug addicts could have the potential to translate into reduced dehumanization of other oppressed groups of people. However, because we did not find a significant interaction between time (pre vs post manipulation), we cannot say this with confidence.

***Homeless inequality.*** Overall, the trend across conditions for support of the Homeless inequality was similar to the trends found in the support for the drug addict inequality. However, there was inconclusive evidence that there was an interaction between condition and SDO, and strong evidence against the null hypothesis, or condition alone predicting support for the Homeless inequality. There was good evidence that SDO alone best predicted support for the Homeless inequality.

Turning to our measures of dehumanization, although we did not find a significant interaction between time and condition, we did find main effects for both. More specifically, we found that participants in the non-addict supremacy condition displayed more humanization of homeless men than control participants. However, it is also possible that the difference in dehumanization between conditions is due to the pre-existing differences in mind attribution, as evidenced in the lack of finding a significant interaction between time and condition (i.e., control participants had lower mind attribution scores than the other conditions, even before the manipulation).

Taken together, the results of the current study provided no evidence for the experimental foundational hypothesis. That is, compared to the other two conditions, challenging human supremacy did not reduce support for the human-animal or any human inequalities. We did however, find that challenging non-addict supremacy reduced support for the drug addict inequality. Looking at the means and standard errors of the data, we found trends that the non-addict supremacy condition also translated to a reduction in support for the homeless and the Bangladesh inequality, however these trends were not significant. It is possible that future studies employing a similar demographic of sample (but with more power) would show these trends to either persist or even out, however, it is unlikely that one would find evidence for the experimental foundational hypothesis using a sample of general international University students. It is therefore possible that challenging human forms of supremacy such as non-addict supremacy could translate to a reduction of support for other human inequalities, such as the homeless and the Bangladesh inequalities. In addition, it is important to consider that these effects may be less pronounced when removing vegetarians from future studies/ analyses, as was evident in the results of study 3.

The fact that we did not find support for the experimental foundational hypothesis contrasts with the results of study 3, and supports the results of study 1. When taking the findings of all three studies which examined the experimental foundational hypothesis (studies 1, 3, and 4) together, we provide evidence that the findings of study 3 are likely due to the participant sample (largely white British, 19-year-old psychology students). The two studies which employed a more diverse range of participants (study 1: UK wide participant pool; study 4 University of Edinburgh student wide participant pool) are the studies which did not provide evidence for the experimental foundational hypothesis.

***Charitable donations.*** We found no difference in charitable donations between conditions. We did find a trend that participants in the non-addict supremacy donated less money to charity on average than participants in the other two conditions, however, this effect was not significant when controlling

for SDO. In short, we found no evidence that challenging human supremacy or non-addict supremacy had an impact on real world charitable behaviour. It is possible that these results are limited because of the lack of power in this study, and research on human-animal relations would therefore benefit from employing behavioural measures of the impact of supremacist thoughts and ideologies in the future.

***Creativity.*** We found no differences in any of our three creativity measures between conditions. When taken alongside our finding that participants in the non-addict supremacy condition displayed less support for the drug addict inequality, this suggests that it is not necessarily an increase in creativity divergent thinking / a reduction in heuristic thinking that is causing the shift from challenging non-addict supremacy to reduced support for the drug addict inequality.

***Dehumanization.*** We found that participants in the human supremacy condition showed a significant increase in the mind attributed to animals (a significant reduction in dehumanization) after their manipulation. This finding is interesting because it occurred despite participants not showing a reduction in support for human-animal inequality. This finding supports our correlational results that support for human-animal inequality and dehumanization of animals are not strongly correlated, whereas the correlation between dehumanization and support for human inequalities are negatively correlated, with strong evidence for the correlation between dehumanization and support for inequalities for drug addicts and the homeless.

**8.4.4 Limitations.** The two key limitations of study 4 are the sample size and the participant demographics. We were not able to collect the desired amount of participants due to time constraints, in that we could not recruit enough participants as our power analyses suggested. Consequently, we could not exclude the vegetarians from analyses. However, we were still able to detect the difference in support for the drug addict inequality between conditions, supported with Bayesian analyses that is not limited to sample size restraints as frequentist statistics is. Therefore, it is unlikely that we would observe different effects with additional participants.

The second limitation of study 3 is that the participants were largely comprised of non-white international students, and therefore some of the dependent measures were not as theoretically relevant as in previous studies using white British nationals. For example, support for the drug addict, homeless, and Bangladesh inequalities all surround the UK, and therefore the results from this study, are not as generalizable to the previous findings of this thesis. The reason why we employed nonwhite international students was because we advertised for participants on a University wide platform, and we therefore did not foresee that it would be mostly international students which signed up for the study. In saying that, the fact that we did use many international students still provides a novel examination of human-animal relations, and how foreign people (i.e., the international students in this study) support another country (e.g., the UK) oppressing animals, drug addicts, the homeless, and Bangladesh sweatshop workers.

## 8.5 Conclusion

The key takeaway from study 4 is that we did not find evidence of the experimental foundational hypothesis. In addition, we did not find evidence that our manipulations influenced our new behavioural measure of support for inequalities - charitable donations. We also did not find any effects of our manipulations on creativity, but we did find that participants in the human supremacy condition showed a decrease in dehumanization (an increase in mind attribution) of animals after the manipulation compared to the other two conditions. Taken together, these findings support the findings of study 1, and contrast with the findings of study 3.

# Chapter Nine: General Discussion

In this chapter we provide an overview of the aims, rationale, and findings of this thesis, before outlining the strengths and merits of this work. We then discuss the contribution of this thesis to the existing literature on the psychology of human-animal relations and finish by considering the limitations of the thesis and avenues that future research could explore.

## 9.1 Introduction

The aim of this thesis was to examine whether human-animal inequality is foundational to human inequalities. In other words, we wanted to test whether human-animal inequality was foundational to human inequalities. The overall aim of this thesis was driven by a burning question about the connectedness of harmful behaviour in society. We see there are many parallels between human-animal inequality and the inequality of particular human groups in society, and we wondered whether support for these inequalities was psychologically connected.

Many thousands of people around the world dedicate their lives and careers to understanding suffering and exploitation in the world. Whether it is the exploitation of animals, shed light on the current injustices in the world, in a bid to reduce them. From the literature, we noticed that there were important conceptual similarities in how humans exploit animals, and how humans exploit or persecute other groups of people both directly or indirectly.

We reasoned that if human-animal inequality was foundational to other forms of inequality, then reducing support for human-animal inequality might by extension reduce support for human inequalities. That is, if the inequality between humans stems from human-animal inequality, then inhibiting the foundational inequality – the human-animal system – should also inhibit inequalities that are psychologically related. Such a finding would have the potential to greatly advance the global fights for justice in the world today. If human-animal inequality is psychologically foundational to human inequalities, then it would be important for human rights activists and scholars to consider how the perpetual exploitation of animals might be psychologically undermining efforts to reduce the inequality of humans. In brief, we found no

evidence that human-animal inequality is foundational to human inequalities. We did, however, find that support for human-animal inequality and support for human inequalities was consistently positively correlated with each other.

An important point to note is that participants may have experienced small amounts of psychological distress from writing about harmful inequalities, such as the harmful ways some humans treat some animals, or how society treats drug addicts. Accordingly, we received ethics from the University of Edinburgh Ethics Board for our experiments. It may be that participants are sensitive to information about animals being harmed, or they even may have family members who have experienced trouble with drug addiction- indeed some participants may themselves have a history of drug addiction. Consequently, it may be that some participants found the writing task difficult. Anticipating this, we included a debrief at the end of each study which outlines that the study was hypothetical (i.e. we weren't suggesting any groups were inferior to other groups), and we were interested in looking at the relation between various forms of inequality. We also reminded participants in the information sheet before the study began that all of their responses were anonymous, and reminded participants that they were not obliged to complete the experiment, and that at any point they could cease participating in the study. We now provide a summary of each chapter.

## 9.2 Summary of Thesis Chapters

**9.2.1 Chapters One, Two, and Three.** Before examining our research question, chapter 1 covered the psychology of human-animal relations, and chapter 2 outlined how human-animal relations are similar to human relations. Chapter 3 then showed how human-animal and human inequalities are psychologically related, and posed the central research questions of this thesis: is human-animal inequality foundational to human inequalities? Our literature review gave a wide overview of human-animal relations, and provided novel speculations about the consequences of human-animal relations for human relations. For example, we brought together literature on the psychological consequences of pet ownership; the veterinary profession; working in slaughterhouses; and consuming meat – topics which have

previously not been reviewed together. Covering a wide range of human-animal relations in the introductory chapters was important to give an accurate portrayal of current human-animal relations in the UK today, and then allowed us to compare those human-animal relations with human inequality discussed in chapter 3.

**9.2.2 Chapter Four.** The overall aim of chapter 4 was two-fold. First, the two pilot studies were used to determine which human inequalities produced a similar principal component analysis (PCA) result as human-animal inequality PCA result. We used Prolific Academic, a UK wide participant pool to recruit our participants. In chapter 4, we presented our scale that captured individual differences in the endorsement of various forms of human and human-animal inequalities. The results of the pilot studies revealed that the drug addict inequality was supported the most by participants, and produced the same PCA result as human-animal inequality. Secondly, the pilot studies were used to provide a test for our correlational foundational hypothesis: that support for human-animal inequality will be foundational to human inequalities. However, we found no evidence of the correlational foundational hypothesis. Instead, we found that support for human-animal and human inequalities was correlated, but support for human-animal inequality was the weakest predictor of human inequalities, compared to the other human inequalities. For example, support for the drug addict inequality was best predicted by support for the homeless inequality, not human-animal inequality.

The inclusion of the pilot studies are a strength to the overall thesis. Our pilot studies enabled the development of our 4-item scales that have strong face validity, consistently good internal reliability, and convergent validity with existing validated scales of SDO and System Justification. It was important to develop our own measure because, to the best of our knowledge, there does not exist a measure of support for inequalities that can be used to compare across human-animal and human systems. While the 4-item scale was useful for the purposes of this thesis, we believe that future work could expand on the development of the scale, and utilize exploratory factor analyses and confirmatory factor analyses to identify the most appropriate scale items.

Nonetheless, the scale developed in this thesis is a good starting point for future research.

Identifying the ideal human inequality to use as a comparison was crucial to the design of this thesis because we wanted to examine whether challenging human supremacy over animals was foundational to human inequalities. However, to properly test the Foundational Hypothesis, we also wanted to determine whether challenging a human form of supremacy would have a positive downstream effect on support for human inequality. Our pilot studies provided good empirical evidence that participants supported human-animal inequality the most out of all inequalities explored. In addition, our pilot studies identified that the ideal human inequality to use as a comparison to human-animal inequality was the drug addict inequality, because participants supported this inequality the most. The drug addict and the human-animal inequalities share important overlaps. For example, they both involve a concerted effort by the government, the private sector, the media, and the public, to persecute (in the case of drug addicts) or kill (in the case of animals) vulnerable beings, while most of the public is apathetic towards the plight of both groups. We therefore needed to ensure that challenging a human form of supremacy did not have downstream benefits for reducing support for human and human-animal inequalities. Therefore, we wanted to challenge human supremacy over animals but also in another condition challenge supremacy over drug addicts and measure the impact of support for inequalities.

**9.2.3 Chapter Five.** Now that we had created our measures and identified the comparison human inequality, the aim of chapter 5 was to examine our experimental foundational hypothesis. We wanted to see whether challenging human supremacy over animals would reduce support for both human-animal and human inequalities. We wanted to confirm that challenging non-addict supremacy over drug addicts would not have the same downstream effects by reducing support for human-animal inequalities. Study 1 developed a novel self-persuasion manipulation to challenge supremacy over three different groups; human supremacy over animals, non-addict supremacy over drug addicts, and book reader supremacy over TV watchers (control). We also

used a UK wide participant pool to recruit our participants for chapter 5. We found no evidence of the experimental foundational hypothesis. We did however, confirm that support for the human-animal and human inequalities are correlated. In addition, replicating pilot study 2, we did not find evidence of the correlational foundational hypothesis. Instead, we found that support for human-animal inequality was not a foundational predictor of human inequalities.

A qualitative analysis of the written component of the results revealed that participants in the human supremacy condition were challenging human supremacy using a wide variation of arguments during their written manipulation. For example, in the human supremacy condition, some participants wrote that humans can be cruel and are therefore not superior to animals, whilst others focused on animals being better skilled at hunting and outdoor skills, and thus meaning humans are not superior to animals.

The quantitative results revealed that the non-addict supremacy manipulation effectively changed participants' support for the drug addict inequality. Given that this manipulation proved effective, we did not spend resources trying to improve it. As before, qualitative analysis of the non-addict supremacy condition revealed that participants write about a variety of things, albeit with less variability than the human supremacy condition. For example, participants wrote about drug addicts having adverse childhood experiences, people being addicted to less harmful drugs, and even questioned the arbitrary notion of supremacy itself. Control participants also wrote about different ways in which book readers were not superior to TV watchers. Taken together, these findings reveal that there are qualitative differences in what participants are thinking about whilst carrying out the same task (Bastian, Costello, Loughnan, & Hodson, 2012). Having a qualitative component to our study was a strength because we could capture this difference between participants. The variability in our qualitative findings raised interesting questions for future work on human-animal relations that we discuss in the Limitations and Future Directions section of this chapter.

**9.2.4 Chapter Six.** Because we did not find evidence for the experimental foundational hypothesis, the purpose of chapter 6 was to frame the human supremacy measure in three different ways in an attempt to identify the most effective way of prompting participants to challenge human supremacy. We again found a null result – there was no evidence of a difference in support for either the human-animal or human inequality as a function of what participants chose to write about. We again used a UK wide participant pool to recruit our participants that included an even number of men and women, participants from a wide range of ages, occupations, and political affiliations. However, the most relevant research on the psychology of human-animal relations has only found that changing animal attitudes has an impact on human outgroup attitudes using a particular sample: 19 year old, mainly female, Canadian psychology undergraduates (Bastian, Costello, Loughnan, Hodson, 2012; Costello and Hodson, 2009). We therefore wondered whether the null findings of chapter 4 and chapter 5 were due to differences in the participant samples between the current work and previous work (Bastian, Costello, Loughnan, Hodson, 2012; Costello and Hodson, 2009).

**9.2.5 Chapter Seven.** In chapter 7, we found empirical support for our experimental foundational hypothesis using first year undergraduate students from the University of Edinburgh. As per recent research, the majority of these participants were 19 years of age, and were female. We found that participants who challenged human supremacy, using the idea that supremacy is arbitrary, displayed significantly reduced support for human-animal inequality. Further, they showed marginally reduced support for the drug addict inequality, compared to control participants. These effects were less pronounced when excluding vegetarians and vegans from analyses. This suggests that the downstream effects we found, by arguing that human supremacy is arbitrary, was driven largely by our vegetarian and vegan participants.

We found that participants who challenged the idea that non-addicts are superior to drug addicts showed a reduced support for the drug addict inequality, however there was no downstream effect on support for the human-animal or the Bangladeshi, inequalities. Finally, we also found that support for

human-animal inequality was foundational to support for human inequality. At the end of chapter 7, we had initial evidence both for (chapter 6) and against (chapter 4) the experimental foundational hypothesis.

**9.2.6 Chapter Eight.** The purpose of chapter 8 was to provide a final examination of the experimental hypothesis. We also wanted to examine potential mediators in the model, and employed a measure of creativity and a measure of dehumanization. We also wanted to include a behavioural measure of support for inequalities, and included a measure of charitable donations to either an animal welfare charity or a drug addiction charity, and measures of creativity to explore potential mediators. Corroborating the findings of chapter 4, we found no evidence for the experimental foundational hypothesis, no evidence of an effect on the behavioural measure of charitable donations, and no effect on creativity. We therefore did not have the requisite correlations to test for mediation. We did, however, find that participants who challenged human supremacy over animals attributed more mind to animals (dehumanized animals less) following their manipulation, compared to controls. We also found that participants in the non-addict supremacy condition supported the drug addict inequality significantly less so than participants in the other conditions. We did not have the power to remove the vegetarians and vegans from analyses and so it is likely that these effects would be reduced in future research replicating this thesis.

## 9.3 Thesis Strengths

There are numerous strengths of this thesis that contribute to the psychology of human-animal relations. While the individual studies have their own merits, there are also more general merits to this work. When taken together, this thesis has revealed important insights about human intergroup relations in society, and how human-animal relations might be connected to them. We now provide examples of how this thesis adds to the wider literature on the psychology of human-animal relations, and how the ideas and findings in this thesis can be examined in future research.

In this thesis, we examined an important research question which itself (or variations of it) have the potential to stimulate further research on the topic,

and advance our understanding of the connection between various human and human-animal injustices in society. In addition to the importance of the overall research question itself, there are methodological strengths that are found throughout the empirical chapters of this thesis. Below we will discuss aspects of this thesis, such as the participants, study design, measures, and statistical analyses, which contribute to the development of the psychology of human-animal relations.

**9.3.1 Participants.** We used a variety of UK participants in this study, including three different participant populations. For example, we used a UK wide sample in the pilot studies, and study 1 and 2; University of Edinburgh Psychology 1st year undergraduates in study 3; and University of Edinburgh undergraduates and postgraduates from a variety of nationalities in study 4. Employing a diverse range of participants allowed us to examine whether our findings held cross-culturally, or whether (as with study 3) our findings were dependent upon the demographic of participants employed. Employing a variety of participants gave us confidence in interpreting the inconsistent results found in study 3.

**9.3.2 Study Design.** In addition to the participants, we also used a variety of research methods including online and laboratory based studies. Our online samples allowed us to include a diversity of participants from around the UK – which we could not have recruited otherwise, given our resources. In addition, study 4 – our laboratory-based study – gave us more experimental control. For instance, one recognised downfall of online data collection is that the experimenter has no control over the circumstances in which someone will survey. Participants could begin filling out the survey, then have a break for an unknown time and then return to complete the survey.

**9.3.3 Measures.** We employed a variety of measures in this thesis. Primarily, we used surveys to collect data, however we also employed a behavioural measure (charitable giving; study 4). Doing so allowed us to examine whether our manipulations had any effect on real world behaviour. We also developed our own scale that was used in all experimental chapters. Developing our own scale adds to the psychological literature by providing the

first measure of support for both human-animal and human inequalities. We also included a measure of SDO that is a reliable and valid measure of support for group inequality in society (Pratto, Sidanius, Stallworth, & Malle, 1994).

Using SDO throughout our studies provided convergent validity for our own measure of support for inequalities, and additionally allowed us to control for individual differences in SDO in each of our studies. This was important as previous work has shown that SDO is consistently a strong predictor of both prejudice towards humans and animals (Dhont, Hodson, & Leite, 2016). Including SDO was a strength of this thesis as all our empirical studies show that for most dependent measures, SDO alone was the best predictor of support for both human-animal and human inequalities; over and above any effect our manipulations had on the dependent measures. This finding complements the Social Dominance – Human Animal Relations Model (SD-HARM) by Dhont, Hodson, and Leite (2016). The SD-HARM posits that it is individual differences in social dominance orientation that explain the association between speciesism and ethnic prejudice. Complementing this research, we have shown that individual differences in SDO were often a better predictor of our dependent measures than were our manipulations. Moreover, the findings of this thesis show that in addition to ethnic prejudice and speciesism, SDO also predicts support for the human-animal, Bangladesh, and drug addict inequalities. In study 4, we also included measures of dehumanization and a measure of creativity to explore potential mediators, if the results replicated study 3. However, we did not replicate study 3, and further, we found that the potential mediators were not correlated with the dependent measures, and therefore we could not test for mediation. Despite this, the inclusion of the dehumanization and creativity measures allowed us to examine the correlations and main effects between these pre-existing and validated relevant measures, and our own dependent measures.

**9.3.4 Statistical Analyses.** We applied both frequentist and Bayesian analyses to our data. First, unlike null hypothesis significance testing (frequentist analyses) Bayesian analyses uses prior knowledge about the world to compute the Bayes factors, and allows for sequential predictions

across studies to update one's beliefs about the world in accordance with the findings from previous research (informed priors) (Dienes & Mclatchie, 2018). However, we did not have the expertise to conduct these analyses, and used the factory prior settings on the JASP software to compute our Bayes factors (uninformed priors). Future research would benefit from employing informed Bayesian priors in research on human-animal relations (Dienes & Mclatchie, 2018). Using Bayesian analyses also allowed us to make post hoc analyses without adjustments for multiple comparisons, such as when excluding vegetarians and vegans in study 3 (Dienes & Mclatchie, 2018). That is, we could make post hoc comparisons without increasing the likelihood of Type II errors, as is the case with frequentist analyses. Further, Bayesian model comparison, unlike null hypothesis significance testing (NHST), allow testing of the null hypothesis (Dienes & Mclatchie, 2018). This is an important feature of Bayesian analyses and allows us to have confidence in interpreting when there is support for the null model, versus a lack of support for the alternative hypothesis. Whereas NHST can only provide (or fail to provide) evidence for the alternative hypothesis, Bayesian model comparison provides a continuous measure of support for both the alternative model(s) and the null hypothesis. Further, Bayesian model comparison provides a continuous measure of support for competing models predicting the dependent variable. Doing so allowed us to compare 1) the main effects of the Independent Variable with 2) the interaction with SDO as a covariate, and 3) SDO alone predicting the Dependent Variable. We therefore had more confidence in interpreting the inconsistent results of study 3 because we could see that while the frequentist post hoc comparisons were marginally significant for support for the drug addict inequality, the Bayesian model comparison revealed that SDO alone best explained the data. The model comparison feature of Bayesian analyses therefore provides a more rigorous analysis of what model best predicts the dependent measure compared to frequentist statistical analyses. For an overview of Bayesian analyses, see Dienes (2014); Dienes and Mclatchie (2018); and Kruschke (2011).

**9.3.5 Quantitative and Qualitative methods.** Finally, the inclusion of both quantitative and (post-hoc) qualitative analyses allowed us to fully examine all aspects of our data. While we did not initially intend on properly examining the qualitative data (as relevant previous research has not), our post-hoc analysis of the qualitative component of the participants' results provides a rich insight into how people think about supremacy over animals, and supremacy over drug addicts. Our qualitative findings were encouraging, benefited future experimental chapters, and aided our insight into potential psychological mechanisms behind the relationship between supremacy and support for various inequalities. We believe qualitative analyses in the psychology of human supremacy, and supremacy over drug addicts would be a fruitful area for future research to explore.

## 9.4 Contribution of this Thesis to the Literature

This thesis contributes to the literature in several ways. We provide evidence of the correlational and experimental findings of our empirical chapters, and discuss the ways in which each contributes to the advancement in the understanding of the psychology of human-animal relations.

**9.4.1 Correlational findings.** The existing literature on the relationship between human-animal relations and human relations has focussed solely on perceptions of local racial or religious outgroups (e.g., ethnic outgroups, religious outgroups, and refugees). For example, the Interspecies Model of Prejudice by Costello and Hodson (2009; 2014) posits that prejudice towards humans and animals are related, and that the source of ethnic outgroup dehumanization is the subjugation of animals. Moreover, the Interspecies Model of Prejudice suggests that reducing prejudice towards animals (i.e., reducing the human-animal divide) can improve outgroup prejudice (i.e., increase immigrant humanization).

As previously mentioned, the SD-HARM model by Dhont, Hodson, and Leite (2016) also found that it is individual differences in SDO that connect ethnic prejudice towards humans and animals. Specifically, the authors suggest that it is the common hierarchical intergroup relations between ethnic prejudice and the subjugation of animals that connects prejudice towards

humans and prejudice towards animals. These two theories represent important advancements in the psychology of human-animal relations, and the current research draws on their theorizing and findings for inspiration in this thesis.

This thesis extends and adds to those theories by illustrating that the subjugation of animals is not only associated with ethnic prejudice, but that the whole human-animal inequality is associated with support for a variety of human inequalities including the persecution of drug addicts in the UK and the exploitation of Bangladesh sweatshop workers. Therefore, this thesis has highlighted that the exploitation of animals is related to human relations in a wider sense than previously considered (Amiot & Bastian, 2014; Costello & Hodson, 2014; Dhont, Hodson, & Leite, 2016). This thesis is, to the best of our knowledge, the first quantitative work to link the exploitation of animals to human outgroups who are treated with apathy, not antipathy. All previous quantitative psychological research on the connection between human-animal relations and human relations has been focussed on human outgroups that people hold direct prejudice towards (Costello & Hodson, 2014; Dhont, Hodson, & Leite, 2016). More specifically, this thesis contributes to the BIAS map work by Cuddy, Fiske, and Glick (2008), and shows that the exploitation of animals is related to the inequality of human groups seen as low in comptenece, and who are treated with apathy and indifference, such as drug addicts and Bangladesh sweatshop workers. This is an important finding of this thesis which is likely to advance the scope of future psychological research on human-animal relations and inequalities.

***Contribution to the psychology of human-animal relations.*** Our initial correlational foundational hypothesis was that support for human-animal inequality would be the strongest predictor of human inequalities. In contrast to our initial hypotheses, we found repeatedly that it is other human inequalities that are the strongest predictors of human inequalities. In short, we found no support for the correlational foundational hypothesis in any of the five empirical studies (pilot study 2; studies 1-4). The finding that support for the Bangladesh and the drug addict inequality were consistently more strongly correlated, than

support for human-animal inequality is of interest. Firstly, it challenges previous work (Costello & Hodson, 2014).We found that for some human targets at least (e.g. drug addicts), it is support for other human inequalities (e.g. support for the Bangladesh inequality), not support for human-animal inequality which best predicts support for human inequalities (i.e. the drug addict inequality).

So—what might this mean? Specifically, what does it mean that people who support human-animal inequality are also likely to support the drug addict and the Bangladesh inequality? We suggest that these correlational findings suggest that the way psychologists think of and study the impact of human-animal relations could be broadened. Indeed, the persecution of drug addicts by the state, and the purchasing of Bangladesh sweatshop clothing from a retail store on the high street are two very different things, and yet they correlate reliably with each other, and with support for exploiting animals. These findings will be valuable to both academics and to activists promoting animal rights and human rights. One of the key differences between the previous work and the current work is that previous work has explored how prejudice towards animals is related to prejudice towards religious and ethnic outgroups in a national context, whereas this thesis has examined the connectedness of human-animal inequality and the inequality between human outgroups fuelled by apathy, not antipathy. While the drug addict inequality is a local inequality, the Bangladesh inequality is an international inequality that has gone unstudied in quantitative social psychology.

What we have shown in this thesis is that people who support human-animal inequality also support human inequality. This is an important extension to previous human-animal relations work because the consequences for exploiting and oppressing animals may have far wider consequences than direct prejudice towards people in our daily lives, and social locations. Compared to last century, the level of direct and violent racist and prejudice behaviour in the west has dramatically fallen (Pinker, 2011). However, there remains gains to be made. For the most part, most people in the West do not violently harm or verbally abuse outgroup members in society, even if there

remains prejudice and bigoted thoughts - violence has reduced (Pinker, 2011). In contrast, our support for the exploitation and inequality between overseas countries has dramatically increased in the same time frame. For example, in the 1960's Bangladesh did not produce any clothing for export, and everyday people in the West therefore did not oppress Bangladeshi people via their consumption. However, currently, most people in the West do support the inequality between the Bangladeshi people inadvertently via their consumption of sweatshop clothes. As more production is outsourced to impoverished nations, the everyday consumer is likely to increasingly exploit people in foreign countries, indirectly via their consumption, and not necessarily because of prejudice. It is therefore important for future work on human-animal relations to consider more geographically distant, and more indirect forms of harm that might be related to human-animal inequality. More broadly, psychologists could examine more thoroughly those groups in society who are deemed incompetent and who people are often comfortable with exploiting, such as developing world labour (Cuddy, Fiske, & Glick, 2008).

***Suggestions for future research.*** We believe that future research will benefit from including a more diverse range of human inequalities in the research on human-animal relations, and explore how the exploitation of animals is related to phenomenon beyond direct prejudice. Indeed, the two inequalities, the persecution of drug addicts and the consumption of Bangladesh sweatshop clothing are both behaviours which people relate to only indirectly. Many clothing consumers, like many meat consumers, are blissfully unaware of the true cost of their consumption. And it is for this reason that those inequalities which are out of sight and out of mind – like the Bangladesh inequality and like the consumption of other morally troublesome products such as conflict minerals from war torn Congo – are both likely to be related to the exploitation of animals.

A lot of social psychological research has been dedicated to examining direct and overt examples of prejudice, however, the psychological mechanisms behind more distant forms of exploitation, such as the exploitation of developing world labour are not well understood by psychologists, even

though such behaviour has real and fatal consequences for millions of people worldwide, such as the 1134 Bangladeshis who died when the sweatshop they were working in collapsed in 2013 (UK Parliament, 2019). This thesis therefore contributes to the psychological literature beyond the domain of human-animal relations, and has the potential to stimulate research on the indirect ways in which everyday people contribute to morally troublesome behaviour; the psychological processes at play during consumption of morally troublesome products; and interventions to reduce peoples apathy towards the plight of those who are out of sight and out of mind, and generally be more mindful of the consequences of their day to day behaviour.

In addition, we consistently found that participants' individual differences in Social Dominance Orientation was a reliable predictor of support for both human-animal and human inequalities. Indeed, this thesis has good evidence that the best predictor of human inequalities are in fact other human inequalities (or at least those measured). These findings both add to and contrast with the existing literature. The finding that all inequalities are correlated, sits well with the literature on generalized prejudice (e.g., SDO and RWA), and with the existing models of human-animal relations and human relations (Costello & Hodson, 2014; Dhont, Hodson, & Leite, 2016). For example, the idea that people who are prejudiced towards, or support the inequality between numerous groups is well documented in the literature on generalized prejudice.

However, the finding that SDO nor human-animal inequality is the best predictor of human inequalities conflicts with the main two human-animal relations models, namely the Interspecies Model of Prejudice (Costello & Hodson, 2014) and the SD-HARM theory (Dhont, Hodson, & Leite, 2016). The Interspecies Model of Prejudice suggests that the dehumanization of ethnic outgroups gets its sting (so to speak) from the devaluing of animals. That is, seeing others as less than human is only concerning when being less than human (i.e., an animal or machine) is a bad thing. This thesis, however, found no correlational support for the notion that it is specifically human-animal inequality that predicts support for inequality between people. It is possible that

the discrepancy between previous work and our findings are due to the difference in measures (i.e. dehumanization versus support for inequalities), and the fact that previous work (Costello & Hodson, 2014; Dhont, Hodson, & Leite, 2016) did not include perceptions of drug addicts – the most derogated and dehumanized human groups in the West.

It is also noteworthy that across all studies, we found that participants supported the drug addict inequality more than the Bangladeshi inequality. This is interesting because most participants play a more direct role in the Bangladesh inequality than the drug addict inequality. Further, they likely also benefit from that inequality whereby the sweatshop workers provide clothes and other textiles for the West. In comparison, people do not get any tangible reward for supporting the war on drugs or the persecution of drug addicts, and only tend to support the war on drugs indirectly in their voting behaviour every few years. We think that the negative stereotypes of drug addicts being unclean and dangerous criminals will play a significant role in people condoning the drug addict inequality. It is also likely that because drug addicts are not a social group normally afforded a great deal of moral concern, participants do not care about the persecution of drug addicts. Whereas, on the other hand, it is not socially acceptable to be racist or display disdain for ethnic outgroups (e.g. Bangladeshi's) and so it is possible that participants wanted to seem socially desirable by claiming not to support the Bangladesh inequality, even if they themselves do not actually care about their welfare. It is also possible that participants who claimed not to support the sweatshop inequality, like meat eaters who do not have strong negative feelings towards animals, do not feel the need to endorse the exploitation of sweatshop workers because they do not feel dissonant about their sweatshop consumption in the first place. This is quite striking considering that half of our participants in all studies – Western women – are the demographic who consume the most sweatshop clothing in the world. We suggest that it is likely that, like the meat paradox, there is a consumption paradox to be solved –one that is often solved by society. The consumption paradox likely has a set of dissonance reduction strategies that people employ to reduce the unpleasant feelings that can arise

from awareness of the pain and suffering that one's behaviour causes others. It is also likely that, like meat consumption, most people rarely feel a sense of dissonance because the clothing industry operates in such a way that consumers never come face to face with the production line. For most people, both meat production and clothing production is out of sight and out of mind.

### 9.4.2 Experimental findings.

***Experimental Foundational Hypothesis not supported.*** Overall, we did not find support for the experimental foundational hypothesis. In study 1 and study 4, we found no evidence that challenging human supremacy over animals had an impact on either support for the human-animal or human inequalities. In other words, in two separate studies using two different samples (one UK-wide and one university students) having participants challenge the notion that humans are not superior to animals did not have the hypothesized effect on changing participants support for human-animal inequality. It is therefore unsurprising that we also did not find a change in support for human inequalities; we expected that it would be the change in support for human-animal inequality that would facilitate the change in support for human inequality.

Our test also needed to rule out the inverse foundational direction – whether support for human inequality were foundational to human-animal inequality. In both study 1 and study 4, we found that participants who challenged the notion that non-addicts are superior to drug addicts, showed (marginally) significantly reduced support for the drug addict inequality compared to both the human supremacy and control conditions. There was also very strong Bayesian support for the study 1 and study 4 models when SDO was included as a covariate to predict support for the drug addict inequality. However, there was no downstream benefit of reducing support for the drug addict inequality for either human or human-animal inequalities. What these findings suggest is that our non-addict supremacy manipulation was effective in reducing support for the drug addict inequality, but was not effective in reducing the downstream supremacy over drug addicts. Taken together, while we did not find evidence supporting the experimental foundational

hypothesis, we also found no evidence that the drug addict inequality is foundational to human-animal inequality, or other human inequalities.

***Explaining Experimental Inconsistencies.*** The results of study 3 are inconsistent with the results of study 1 and study 4. In study 3, we found our only case of evidence for the. Specifically, we found that participants that argued that human supremacy is arbitrary displayed less support for human-animal inequality than participants in the non-addict supremacy condition, the control participants, or participants in the human downfall condition (who wrote about the harmful things that humans do). These results remained when excluding vegetarians and vegans from analyses. In addition, we found that participants in the arbitrary condition displayed marginally less support for the drug addict inequality than control participants, however, this effect was not significant nor supported by Bayesian analyses when removing vegetarians and vegans from analyses. In short, it was vegetarians and vegans (who more so opposed human-animal inequality) driving the reduced support for the drug addict inequality, compared to control participants. Consequently, the manipulation did not have a significant downstream effect on the drug addict inequality for meat eaters. In other words, the experimental foundational hypothesis was not found for meat eaters in study 3, and these effects are therefore not generalizable to the public who largely consist of meat eaters. Moreover, by excluding vegetarians and vegans from analyses, we have shown that the people who support human-animal inequality the most (meat eaters), are the least likely to show a downstream reduction in support for human inequalities after challenging human supremacy. Therefore, future research could benefit from exploring whether there are ways of challenging human supremacy for those with the highest pre-existing support for human-animal inequality. For example, it is possible that for meat eaters who more strongly support all inequalities, challenging human supremacy by arguing about the positive aspects of animals (or perhaps the similarities between humans and animals as per previous work by Bastian, Costello, Loughnan, and Hodson (2012)), as opposed to the negative aspects of humans could be effective at reducing support for human inequalities. Regarding the lack of

effect for the negative human condition on support for the drug addict inequality, it may be that using examples of the negative things that some humans do could promote human outgroup bias, thus inhibiting the downstream effect from animals to humans.

We explain the discrepancy between study 3, and studies 1 and 4 with respect to the different samples employed, the differences between frequentist and Bayesian analyses, and in the context of the replication crisis in social psychology. Firstly, the key difference in study design between the studies is the participant demographics. In the pilot studies, and study 1 and 2 we employed a UK-wide sample of adults; study 3 employed University of Edinburgh first year undergraduate psychology students; and study 4 employed University of Edinburgh students from various disciplines including both undergraduates and postgraduates. The only study that showed marginally significant effects for the experimental foundational hypothesis was study 3 using University of Edinburgh first year undergraduate psychology students. We employed this sample specifically because the most relevant psychological research on human-animal relations also used this sample demographic (Bastian, Costello, Loughnan, Hodson, 2012; Costello and Hodson, 2009).

***WEIRD participants.*** Recent theorizing by Henrich, Heine, and Norenzayan (2010) called into question the generalizability of using undergraduate psychology students as participants in psychological research – particularly social psychological research. The authors suggest that psychology undergraduates are too limited of a population to draw meaningful conclusions about wider society. Moreover, research suggests that American university undergraduates are more likely than the general population to give more favourable responses to other groups in society; have higher degrees of self-monitoring (Reifman, Klein, & Murphy, 1989); are more susceptible to attitude change (Krosnick, & Alwin, 1989); and are more susceptible to social influence compared to the general population (Pasupathi, 1999).

It therefore may be that we could find the marginally significant support for the experimental foundational hypothesis in study 3 because our

participants were more susceptible to the manipulation than in any of our other studies (none of which employed psychology undergraduates). The participants in study 3 may also be more likely to find a message about the arbitrary nature human supremacy to be more effective because such questioning of authority and social hierarchies fits with the political viewpoints characterized by undergraduate psychology students (Henrich, Heine, & Norenzayan, 2010).

Taking all experimental results together, we conclude that we did not find reliable evidence for the experimental foundational hypothesis. Considered with the lack of support we found for the correlational foundational hypothesis, it provides good evidence against the overall experimental hypothesis: we did not find evidence that challenging human supremacy reduces support for human-animal or human inequalities. The question therefore remains: are our findings due to there being no foundation of inequality, or are their limitations to the design of the studies that could explain the null results? We provide an answer to this question, and propose further research ideas, by discussing each of the limitations of this thesis in the following section.

## 9.5 Limitations and Future Directions

There are numerous limitations to the methods in this thesis that are important to take into consideration when interpreting our findings. However, the limitations of this thesis also reveal new avenues for future research to explore and therefore contribute to the advancement of the psychology of human-animal relations. There are limitations in the participants we employed, and in the manipulations and measures we designed and used. We now discuss each of these limitations in detail, providing our rationale for the choices we made, and suggesting how future work might use this thesis as a useful step on the path to better understanding the psychology of human-animal relations, and how human-animal relations might relate to human relations.

**9.5.1 Manipulations.** We designed all the manipulations for chapter 5 – 8 of this thesis, and consequently there are some limitations to consider.

Firstly, following a recommendation from Hodson, Kteily, and Hoffarth (2014) we wanted to challenge the widely-held view that humans are superior to animals. In their review, Hodson, Kteily, and Hoffarth (2014) suggested that the human-animal divide (HAD) – the idea that humans are different from and superior to all other animals is the key psychological justification used to maintain human-animal inequality. The laypersons' concept of the human-animal divide involves the idea that humans are meaningfully different to all other species (Bastian, Costello, Loughnan, & Hodson, 2012). Previous research has shown that such a belief predicts the dehumanization of human racial and religious outgroups (e.g., Muslims, refugees, Black people, and Aborigines), and that experimentally reducing people's beliefs in the human-animal divide can foster more humanizing perceptions of those same human outgroups, although only with 19 year old largely female Canadian first year psychology students (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2014). However, no research has examined whether challenging the notion that humans are superior to animals – the second key component of the lay conception of human-animal relations – might have an impact on human relations (Hodson, Kteily, & Hoffarth, 2014). We therefore had to produce our own manipulations for reducing human supremacy. Because of the nature of our research question, we wanted to use a manipulation that could challenge human supremacy over animals, but also a manipulation that could be easily adapted to challenge supremacy over other humans.

***Limitations of our experimental instructions.*** In study 1, chapter 4, we decided to use a manipulation with an open prompt. That is, following previous research which asks participants to challenge the human-animal divide (but does not give instructions on what examples participants should use), we also decided to give participants free reign over how they challenged the supremacy (either human supremacy, non-addict supremacy, or book reader supremacy). In hindsight, we could have refrained from giving participants the choice to use their own examples. We gave these instructions so that if there was an example that participants wanted to give which was not one of the prompts then we thought it best to let the participant use that

example. However, it is possible that encouraging participants to write using either the examples provided, or their own examples, could have prompted participants to provide too many different examples of why humans are not superior to animals. This could have resulted in participants in the same condition experiencing a different psychological process. This is what we found in study 1 where many participants gave multiple different reasons for why humans are not superior to animals. Unfortunately, we did not rectify this issue in the thesis, and all studies included the same instructions; indicating that participants could write their argument using either the examples given, or using their own ideas. We recognize that this is a limitation to this thesis, and see that further research can examine whether providing more strict writing instructions leads to more effective change in the dependent measures. Despite this, we do not believe that changing the writing instructions would have changed the interpretation of the results of the studies. Our manipulations were adapted from previous research on human-animal relations, which used very similar instructions in their studies (Bastian, Costello, Loughnan, & Hodson, 2012). Such previous research did not publish the qualitative results of their studies, and so it is unclear as to whether the qualitative findings of this thesis are consistent or inconsistent with previous work. We suggest that it will be advantageous to the field of human-animal relations if future research provides a discussion of their qualitative findings when employing self-persuasion tasks so that the field can develop more effective manipulations in the future.

A related limitation is that we also gave participants multiple examples that they could write about in the manipulations. For example, participants in the human supremacy condition were asked to imagine they had to convince a friend that humans are not superior to animals, and we gave participants a few examples to help them get started (e.g., humans can do harmful things, and some animals have unique skills), but told participants they could also use their own ideas if they wanted. Participants in the non-addict supremacy group were asked to imagine they had to convince a friend that non-addicts were not superior to drug addicts. We also gave those participants examples of what to

write about (e.g., drug addiction and adverse childhood experiences, and the idea that some people are addicted to 'softer' drugs like coffee), and told them they could also use their own ideas of they wanted. Participants in the control condition were instructed to imagine they had to convince a friend that people who read books were not superior to people who watch TV, again they were given examples of what to write (e.g. that watching TV can be more sociable than reading, and that watching TV can be more enjoyable than reading), were also told that they could use their own ideas.

The qualitative results of study 1 revealed that participants in the human-animal condition wrote a wide variety of justifications as to why humans were not superior to animals, which provided the rationale for study 2. However, in hindsight, the design of study 1 was limited because we could have given participants specific examples to write about, instead of giving them multiple different examples, and telling participants they could also write about another example if they wanted. The rationale behind this decision to give multiple examples was that we did not realise that there would be so much variability in how people think about human supremacy over animals, or that that difference might impact the dependent measures. We thought that it would be enough for participants to challenge human supremacy, whichever way they chose to do it. What may have been better, and what future research can build on, is more fully exploring and identifying the best way to challenge human supremacy over animals. While it could have been a better option for us to do that in the first place, study 2 revealed no difference in the dependent measures as a function of the framing of the human supremacy manipulations, and so it is likely that further refinement of the study manipulations could be used in future research.

A further consideration of the manipulations is that we gave participants in each condition various examples to write about, which could have added noise to the results. For example, participants in the human-animal condition were given examples of various traits that animals have that could be considered better than humans. Quite differently, we gave participants in the drug addicts condition the example that drug addicts were not necessarily

morally responsible for their behaviour because they may have had a troubled upbringing. Quite simply, we were comparing the moral responsibility of behaviour in one condition (drug addicts), with different physical characteristic (unrelated to morality). Therefore, it is possible that this difference may have added noise to the results of the study. Future research will benefit from carefully constructing their manipulations so they are consistent across conditions.

It was only in study 3 that we found that one human supremacy manipulation in particular (human supremacy is arbitrary, but not that humans are harmful) had an effect on the dependent measures. As we have already discussed, the effect in study 3 is likely due to a combination of the manipulation used and the participant demographics. We therefore believe that future research will benefit from examining whether certain human supremacy manipulations are more effective in influencing dependent measures in different types of people. While study 3 revealed that undergraduate psychology students might be more susceptible to the idea that human supremacy is arbitrary, it is possible that different manipulations aimed at male, more conservative, and more socially dominant people will need to be developed to promote the reduction of human supremacy in the general UK population. This is an exciting avenue for future research, and illustrates how this thesis has provided an important contribution to the methods used in human-animal relations research.

Another factor which could have influenced the results is the degree to which participants took the writing task seriously (i.e. were writing compelling arguments). Indeed, the qualitative analyses of the data revealed there was variation in the quality of the arguments given, in terms of length, complex language used, development of arguments, and depth of philosophical engagement with the task. Upon reflection, it is likely that the qualitative differences in the written arguments partly reflect differences in the extent to which participants took the task seriously. Further refinement of the current research methods, or indeed, alternative methods, would be useful for future research to implement. Furthermore, the differences in participants'

argumentation also highlight the usefulness of employing qualitative research methods.

Another important consideration is the role of personal responsibility attributed towards the various groups in the dependent measures. For example, participants may have seen drug addicts as being personally responsible for their position in society (i.e. they choose to take drugs and therefore are responsible for the consequences) whereas animals are not personally responsible for their position in society (i.e. farm animals are destined to be used for meat because of how humans see and treat them – not because of any choices the farm animals made). Future research will benefit from taking personal responsibility into consideration in future research.

***Limitations of the use of 'Animals' in the manipulation.*** A further limitation of the human supremacy manipulation is the choice to use animals (in general) as opposed to using a particular species or subgroup of animals. Our rationale for using animals was derived from previous theorizing by Hodson, Kteily, and Hoffarth (2014) which suggests that human supremacy over animals is a core aspect of human-animal inequality. While this thesis provides an initial exploration of challenging human supremacy over animals, suppose we had used the manipulation 'humans are not superior to pigs', or 'humans are not superior to farm animals', it is possible that we may have a more effective (and perhaps also more clear and simple) manipulation. It is also likely that such a manipulation would lead to more consistent qualitative results possibly having a greater effect on the dependent measures.

We suggest that future research on challenging human supremacy might benefit from exploring the use of comparing humans to single animals (e.g., pigs, chickens, or cows; common meat animals) or comparing humans to subgroups of animals (e.g., farm animals raised for food). In addition, research could explore the effectiveness of manipulations that challenge the idea that humans are not superior to animals used in laboratory testing or trained in circuses. However, this thesis nevertheless provided a sound initial examination of the usefulness of challenging human supremacy over all animals. Whilst we chose to compare humans to animals, instead we could

have compared a specific group of humans to animals. This is discussed in the next section.

***Limitations of the use of 'Humans' in the manipulation.*** Future research could examine whether asking participants to compare a *specific* human outgroup, rather than just 'humans' in general, to animals has an impact on support for inequalitiess. That is, what would be the result of asking British participants to argue that Chinese people are not superior to animals (or a specific species such as pigs)? Or asking Chinese participants to argue that British people are not superior to animals (or a specific animal species such as pigs)? It is possible that this would draw on pre-existing racist beliefs and the result might be increased support for human or human-animal inequalities. The current research therefore has the potential to stimulate numerous different research projects from various intergroup perspectives (e.g., British people are not superior to pigs) as well as from a superordinate perspective (e.g., humans are not superior to animals).

***Additional alternative manipulations.*** We could have explored the merits of framing the supremacy manipulations as humans and animals are equal, or animals are in some ways to superior to humans, and measured the subsequent impact on support for various human-animal and human inequalities. One final avenue for alternative manipulations is that we could have examined the impact of having participants argue the dominant ideology that humans *are* superior to animals, to examine the impact of the mainstream human-animal ideology on support for human-animal and human inequalities. As with the other limitations of the manipulations, this thesis provides a good starting point for future research exploring different manipulations designed to challenge human supremacy over animals.

***Limitations of refining our human supremacy manipulation.*** Another aspect to note about the manipulations is that we decided to refine only the human supremacy manipulation in study 2. The rationale for doing so was that in study 1 we found that the non-addicts' manipulation was effective at reducing support for the drug addict inequality. Accordingly, we decided to devote our resources to improving the human supremacy manipulation that

was not effective, in study 2. In saying that, it is entirely possible that future research could explore different ways to improve and refine the non-addict supremacy manipulation, which could lead to an improvement in the effectiveness of the manipulation. In short, the non-addict manipulation works, but it likely could be improved. Therefore, it is possible that future research could identify a non-addict supremacy manipulation that is more effective in different demographics of people. For example, in conservative populations and among people high in SDO that are more likely to have negative stereotypes of drug addicts in the first place (Altemeyer, 1988). Mentioning that the 'war on drugs' is wasting government resources could be a more effective way to reduce supremacist thoughts over drug addicts, and could reduce support for the drug addict inequality among conservative people (Altemeyer, 1988; Hari, 2015). However, given the findings of the current research, we are less confident that future work will show that challenging non-addict supremacy has a downstream effect on support for human-animal inequality.

***Limitations of the human comparison group.*** The choice of non-addict supremacy as the comparison human group is also a potential limitation of this thesis. The rationale for doing so was because we wanted to identify a human inequality that participants openly supported, so that there was enough variability in the measure to allow for a reduction in support. For instance, had we chose to use the male-female, or White-Black inequality, it is unlikely that many people would (openly) support these inequalities in the UK. Therefore, we were somewhat constrained in our choices for human inequality. In addition, the outcome of the drug addict inequality PCA was the same as the outcome of human-animal inequality PCA. The drug addict inequality was human inequality that participants most endorsed in our pilot studies and further, drug addicts are the most dehumanized human group in the West (Fiske, Cuddy, Glick, & Xu, 2002).

***Additional future directions.*** We also considered the extent to which human inequality was conceptually similar to human-animal inequality. We opted to employ the drug addict inequality for a few reasons. Firstly, they are the most dehumanized outgroup in the West. Secondly, drug addicts are a

vulnerable population routinely persecuted by the state, and thirdly, they are beyond the realm of moral concern for most of the UK public. Reflecting on the choices made in this research, we realise that the drug addict inequality was not the only option we could have chosen. We think that future work would benefit from exploring other human inequalities, and particularly the exploitation of developing world labour. For example, it is possible that future work examining the impact of challenging supremacy over Bangladesh sweatshop workers, or miners from war torn Congo is more fruitful due to the widespread consumption of morally troublesome products, as outlined in this thesis, and the similarities this troublesome consumption has the meat paradox.

Beyond future work utilizing the current study's design, future work exploring the relationship between the meat paradox and the consumption paradox are likely to be fruitful avenues of future research (Bastian & Loughnan, 2017). For example, it is likely there are justifications for consuming morally troublesome products (such as sweatshop clothing and conflict minerals) which people use to reduce dissonance about their morally troublesome consumption. It would also be interesting to examine whether people who are likely to eat meat are also more likely to consume sweatshop clothing. Or alternatively, whether support for the fast fashion industry and the meat industry is related, although not necessarily predictive of each other. The limitations to the manipulations employed in this thesis therefore provide numerous avenues for future research to build on.

**9.5.2 Measures.** Just as there are ways to improve our manipulations, there are also limitations to the measures we used in this thesis.

***Principal Components Analysis.*** We chose to design our own measure of support for inequalities because, to the best of our knowledge, there are no existing measures of this kind. We needed a measure of support for inequalities that could easily be adapted to capture support for both human-animal and human inequalities. Because we had limited resources to spend on creating our scale, we chose to conduct principal component analysis with dimension reduction set to one, because we wanted a single measure best

capturing support for inequalities. A better alternative might be to employ both exploratory and confirmatory factor analyses to inform the creation of the measure.

Specifically, we could have conducted an exploratory factor analysis with a large sample size (N = 500) and included many different aspects of inequalities. We could have explored the dimension structure of the questions and produced a scale more accurate at measuring inequalities than was used in this thesis. We then could have conducted a confirmatory factor analysis in a separate sample (N = 500) to confirm the exploratory factor analyses. Whilst we believe that exploratory and confirmatory factor analyses are important statistical tools to consider when creating a scale, we chose to use principal component analysis for the following reasons. Firstly, we did not have the resources to run the two large studies that would be essential in factor analyses. However, at the very least, if we were to replicate this work we would want to employ more participants in our pilot studies as this would ensure that the results that will inform the creation of the scale are robust. Further, the aim of this thesis was not to produce the perfect measure of support for inequalities, but instead to examine the Correlational and Experimental Foundational Hypotheses. Thus, this research only required a scale that would sufficiently capture support for inequalities. To that end, we developed our 4-item measure of support for inequalities that can easily be adapted to capture support for both human-animal and human inequalities.

Our human-animal inequality measure has strong face validity, and includes questions on whether humans are superior to animals, whether it is ok that humans benefit from harming animals, and whether participants accept the way humans treat animals. In short, we had a scale with good face validity and good internal reliability across all our studies, as measured by the internal consistency measure of Cronbach alpha. In creating our scale, we also included measures of SDO and System Justification that provided good convergent validity; participants who supported inequalities were higher in SDO and System Justification, however, these correlations were not strong

enough as to warrant concern that our new measure was simply a different version of either SDO or System Justification.

We could not have solely used measures of dehumanization of animals and humans throughout this thesis, as measures of dehumanization alone do not capture support for the overall inequality, instead capturing the type of mind that participants think entities possess. We believe that the measure we created meets the requirements of this thesis, and provides a solid foundation for future work to develop a new measure of support for inequalities.

***Focus of questions.*** There are limitations to this research that concern the focus of the dependent measures. Much like the limitations of the manipulations, our dependent measures could also have benefited from being more specific. For example, in human-animal inequality measure we asked participants what they thought about 'humans' and 'animals'. As discussed in our section on limitations of the manipulations, we also could have asked participants what they think about humans and 'farm animals', or humans and 'pigs'. These more specific dependent measures mentioning particular subgroups of animals could be beneficial in capturing subtle differences in support for inequalities. That is, participants may be more likely to change their mind about a particular species or subcategory of animals, compared with 'animals' in general. However, such a change in measures would likely not have changed the Foundational results of this research as participants' downstream change in support for human inequalities would be influenced by the manipulations, and not by the measure of support for human-animal inequality. Future research could examine this empirically.

***Human-animal inequality.*** Instead of asking about humans and animals generally, we could have given specific inequalities such as the meat industry, the clothing industry, the entertainment industry, the pharmaceutical industry, and the cosmetics industry. It is possible that participants are more susceptible to changing how they think about certain treatment of animals. For example, do they feel differently about using animals for testing make up compared with using animals for food? We chose to ask about human-animal relations more generally because we wanted to examine whether participants'

support for human-animal inequality in aggregate was susceptible to change. In hindsight, asking about specific instances of human-animal inequality could capture more subtle changes. Therefore, we are confident that future work will be able to expand on the findings of this thesis, and build on our measure of support for inequalities.

***Nuances of human inequality.*** Future work may find it useful to explore more nuanced aspects of human inequalities, such as support for different components of the drug addict inequality (i.e., differentiating support for the decriminalization versus legalization of drug use). Decriminalization of drug use is where it is not a crime to use drugs, but it is not legal to sell drugs – drug dealing is still punishable, but drug addicts who are caught with drugs for their personal use would not be imprisoned (as they are now in the UK), and instead would be given medical treatment (as they do in Switzerland and Portugal) (Hari, 2016). It is possible that future research could illustrate that support for the drug addict inequality can be separated into finer aspects of the inequality. A more nuanced measure of the drug addict inequality might therefore be more effective at capturing change in support.

***Alternative inequalities.*** Another interesting line of future research would be to include measures of numerous other inequalities. This thesis only examined support for three human inequalities: the drug addict, the homeless, and the Bangladeshi sweatshop inequality. Admittedly, support for the drug addict and the homeless inequality are highly correlated and possibly too highly correlated. This is in part because people stereotype homeless people to be drug users, and because sometimes people also stereotype drug addicts to be homeless. This is not an entirely unreasonable association for people to have for the evidence also suggests a link between drug addiction and homeless (Buchanan & Young, 2000), but nevertheless, future research would likely benefit from employing various additional inequalities. Our measure of support for the Bangladesh inequality is to the best of our knowledge the first empirical study of people's attitudes towards the Bangladeshi sweatshop workers inequality. This measure is also a good example of support for the exploitation of developing world labour more generally. As discussed

previously, future work could expand on our measures by measuring a wider variety of inequalities including support for the exploitation of African miners who mine minerals in war zones (e.g., conflict minerals), and the general support for the exploitation of developing world labour. Further, future work could also examine peoples support for the exploitation of the lower classes for domestic labour. For example, does peoples' support for human-animal inequality also predict support for a living wage, social benefits or progressive taxation?

***Wording of the dependent measures.*** A final limitation of the dependent measure we created is the slightly different wording used between measures. This was purely done in error and in future research we would recommend that the dependent measures are as similar as they can be across conditions. In the current research, one item from human-animal inequality dependent measure read "It is okay humans benefit from the current order of society", whereas the same item from the drug addict dependent measure read "It is okay that non-addicted persons benefit from their treatment of drug addicts". We acknowledge that the difference between the scales is less than ideal, however, we believe it is very unlikely that this would have greatly influenced the interpretation of our findings. Future work will only benefit from employing more concise measures of support for inequalities.

***Timing of manipulation task.*** A further limitation of this thesis is that in the early studies (1-3) we did not control how long participants could spend on writing their manipulations. Thus, we allowed participants to continue to the dependent measures once they had written a few sentences in the writing task. In study 4, we instructed participants to spend at least two minutes on the writing task, however, we yielded the same results as study 1. Despite this, future research could employ a minimum time limit, if they use a similar manipulation, to encourage greater depth of thought.

***Additional future research ideas.*** Future research could examine the natural variation in meat eating behaviour to determine whether it has any relationship with support for human inequalities. For example, an interesting cross-cultural study would be to explore the relationship between meat eating,

and consumption of morally troublesome products. Specifically, research could explore support for the drug addict inequality between India (the country with the highest proportion of vegetarians at 30-40%; Kumar & Kapoor, 2014) and the Western world. It is possible that because of the association between vegetarianism, Hinduism, and purity in India, that vegetarians in India are even more likely than their Western meat-eating counterparts to support human inequalities. Whereas for Western cultures such as the UK, it is likely that vegetarianism is associated with decreased support for the Bangladesh and drug addict inequality, as trends in this thesis suggest. While currently speculative, such cross-cultural research would contribute well to the psychology of human-animal relations, and has the potential to show the complexities and cross cultural nuances between human-animal inequality, and human inequalities.

**9.5.3 Summary of limitations.** To summarise, we prefaced the limitations section by questioning whether our inconsistent experimental findings were attributable to limitations in the research design, or evidence that there is no foundational inequality. After considering the evidence supporting and opposing the experimental foundational hypothesis, we conclude that we do not have any robust evidence to support our alternative hypothesis. However, should future research make improvements to the current measures and manipulations, we think it is possible to find evidence that would support our experimental foundational hypothesis. Despite our optimism, we also recognise that it is possible that challenging beliefs on human supremacy has no meaningful effect on support for human inequalities in the wider adult meat eating public.

In addition, future research may reveal that challenging human supremacy can lead to a reduction in support for both human, and human-animal inequalities. However, whilst this is possible it is not probable, as challenging human supremacy is likely to prime thought and feelings of ‘humanity’. This may further perpetuate the distinction between humans and animals, and consequently perpetuate support for human-animal inequality, even if challenging human supremacy reduces support for human inequalities.

In short, future research on the experimental foundational hypothesis needs to be conducted and replicated before any clear and meaningful conclusions are drawn concerning the relationship between human-animal inequality and human inequalities. However, the possibility that the null results are not due to limitations of the methods and are legitimate null results is also an important consideration. For example, it may be that there isn't support for the foundational hypothesis simply because there is no real-world effect to detect. Considering that we found quite consistent null findings in this thesis, there may well be a true null effect. Future research utilizing an internal Bayesian meta-analysis will add further clarification of whether there is overall support for a null effect.

## 9.6 Conclusion

Humans harm animals in numerous ways; from food (e.g. meat and dairy products), to fun (e.g. circuses and fox hunting) and fashion (e.g. leather). Cumulatively, these harmful practices constitute a inequality. The majority of the animals we choose to kill are unthreatening and represent a vulnerable population that pose no immediate threat to humans (e.g. cows, pigs, sheep, and chickens). However, instead of caring for these harmless animals – as we do pets – we systematically treat those animals in violent and cruel ways. Further, our society facilitates these behaviours and thus they are not just accepted, but have become the norm.

Central to this thesis, we noticed that the inequality between particular human groups share important parallels with human-animal inequality. For instance, the persecution of drug addicts in the UK, and the exploitation of labour in the developing world both constitute inequalities characterized by an apathetic public that are indifferent to the suffering of vulnerable human populations. However, because human-animal inequality is more violent and arguably causes more suffering than the inequality between drug addicts and the rest of society and those who make versus those who purchase sweatshop clothes, we reasoned that human-animal inequality would be foundational to inequality between humans.

Previous work (Hodson, Kteily, & Hoffarth, 2014) explored this question, and found that belief in the human animal divide was a predictor of prejudice towards both humans and animals. That is, the belief that humans are both fundamentally different from, and superior to, animals. Other research (Bastian, Costello, Loughnan, & Hodson, 2012; Costello & Hodson, 2009) has similarly shown that challenging the idea that humans are different from animals can reduce prejudice towards animals, immigrants, and racial and religious outgroups. However, this research only employed 19 year old Canadian first year undergraduate psychology students. To our knowledge, no research has examined the impact of challenging human supremacy over animals on prejudice towards animals and other human 'outgroups'. Nor has any quantitative psychological research examined the relationship between human-animal and human inequalities. This purpose of thesis was to explore beliefs surrounding human supremacy, and to determine the psychological connection between the human-animal and human inequalities.

We predicted that support for human inequalities would correlate more strongly with support for human-animal inequality, than with other human inequalities – our correlational foundational hypothesis. That is, we believed that people who were indifferent to the suffering of other human groups, would care even less about the suffering of animals. In addition to our correlational hypothesis, we also had an experimental hypothesis: we predicted that challenging human supremacy would reduce support for human-animal inequality, and by extension reduce support for human inequalities.

Across three experiments, participants were randomly assigned to one of three conditions; (1) challenging human supremacy over animals (2) challenging non-addict supremacy over drug addicts, or (3) challenging book readers' supremacy over TV watchers (control condition). We then measured support for the human animal and human inequalities. However, we found no strong evidence for our experimental foundational hypothesis. In study 3 – our only study using 19 year old first year undergraduate Psychology students - we found marginal evidence that challenging human supremacy over animals could reduce support for both human-animal inequality, and human inequality

faced by drug addicts.. However, these findings changed when vegetarians and vegans were excluded from the analyses. The analyses showed that participants who challenged human supremacy displayed a reduction in support for human-animal inequality, but did not show a reduction in support for the drug addict inequality. We also did not find any evidence of the correlational foundational hypothesis. Instead, across all studies support for human-animal inequality was strongly correlated with – but not foundational to – support for human inequalities. That is people could be indifferent to the plight of animals, but could care about other human groups.

The variability in participants' qualitative responses suggests that future qualitative research exploring the different justifications that participants employed would be valuable. We believe that more research is needed in this area – both quantitative and qualitative – to fully understand the important, but relatively understudied psychological relationship between human-animal and human inequalities. This thesis contributes an initial, but important, step in understanding the relationships between inequalities. That is, support for human-animal inequality is psychologically related – but not foundational – to human inequalities.

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